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NEW Prospectus

OF THE

SCIENTIFIC AMERICAN.

VOLUME THIRTEEN.

To Mechanics, Manufacturers, Inventors, and Farmers.

In announcing the Thirteenth Annual Volume of the SCIENTIFIC AMERICAN, which commences on the 12th of September, the Editors and Publishers embrace this opportunity to thank their numerous friends and subscribers for the encouraging and very liberal support heretofore extended to their journal, and they would again re-assure their patrons of the determination to render the SCIENTIFIC AMERICAN more and more useful, and more and more worthy of their continued confidence and good will. The undersigned point to the past as a guarantee of their disposition to always deal justly and discriminatingly with all subjects of a Scientific and Mechanical character which come within their legitimate purview.

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It is the aim of the Editors of the SCIENTIFIC AMERICAN to present all subjects discussed in its columns in a practical and popular form. They will also endeavor to maintain a candid fearlessness in combating and exposing false theories and practices in Scientific and Mechanical matters, and thus preserve the character o the SCIENTIFIC AMERICAN as a reliable Encyclopædia of Useful and Entertaining Knowledge.

Sampson Low, Son & Co., the American Booksellers, 47 Ludgate Hill, London, Eng., are the English Agents to receive subscriptions for the SCIENTIFIC AMERICAN.

Single copies of the paper are on sale at the office of publication and at all the periodical stores in this city, Brooklyn, and Jersey City.

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☞ Specimen copies will be sent gratis to any part o the country.

MUNN & CO., Publishers and Patent Agents,
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WALTON & EDGARTON'S LATHE.

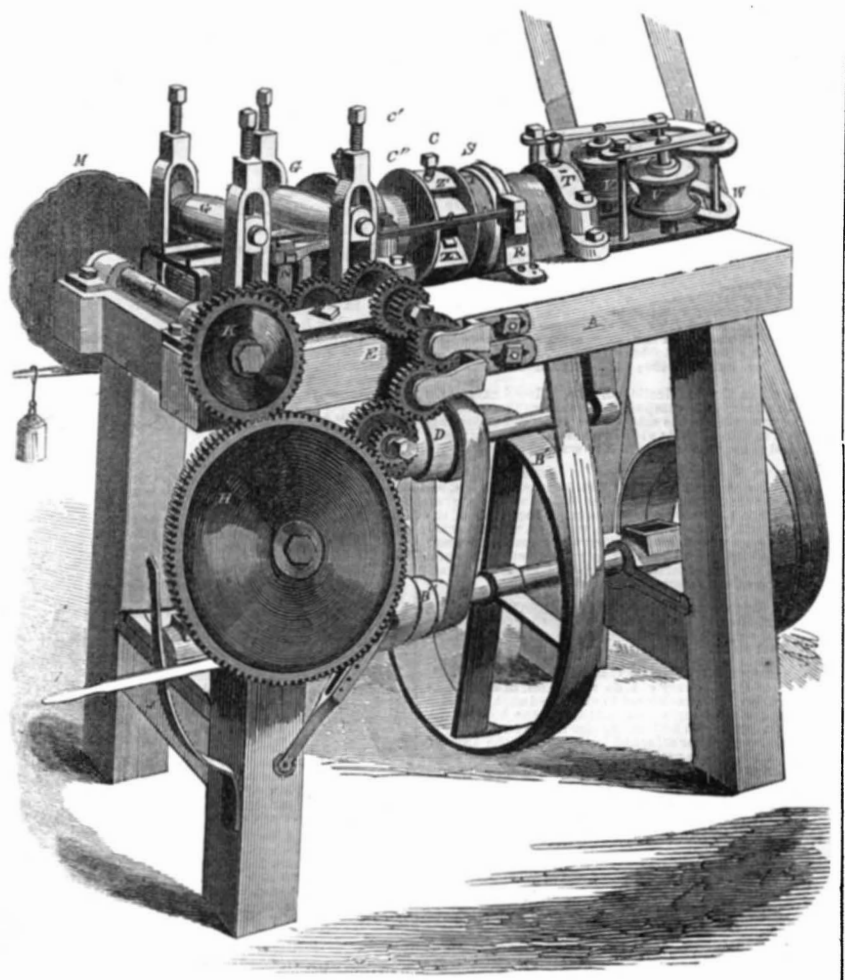


Fig. 1 is a perspective view of an ingenious and compact automatic lathe, for the production of beaded work of any kind, invented by G. W. Walton and H. Edgarton, of Wilmington, Del., and patented on July 7, 1857. The cutter head is hollow, and the cutters are mounted in such manner that, by a very simple movement, the edges are removed from, or brought nearer to, the axis of motion, the movement being governed by a cam outside. This cam may be made in any required form, and the configuration and disposition of the beads are thereby under complete control. Fig. 2 is a transverse section of the cutter head, and Fig. 3 a diagram of the cam or pattern, with the lever which controls the movement of the cutters being kept in contact with its periphery by a weight.

A is the frame of the machine, B the pulley which receives the motion from a belt, B′ a larger pulley, which transfers the motion of the first shaft to the hollow cutter head, and B″ cone pulleys, which give the feed motion. C C represent the cutter head, the acting portion of which is embraced between the two disks shown. D represents cone pulleys to receive the feed motion from B″ by a belt, and E represents a train of gearing which conveys the motion of D to grooved feed wheels denoted by F. G G are smooth rollers mounted above the feed wheels, and pressed down by rubber springs, which are fixed in the housings represented. H is a movable gear wheel, which may be thrown into or out of gear, by properly manipulating the lever or handle, I. J is a spring, with notches to hold I in or out of gear, at pleasure. The object of this movable wheel is to start and release the pattern wheel at pleasure. K is a gear wheel mounted on one extremity of the shaft, L. M is the pattern wheel or cam. N represents one of two levers, mounted on the rock shaft, N′, seen in Fig. 3; and on the extremity of this rock shaft is the longer lever, N″, Fig. 3. N″ carries a small friction wheel, which is held in contact with the periphery of N, by the gravity of the weight, N‴, suspended on an additional arm. These parts, although very important, are necessarily shown but imperfectly in the perspective view, but may be readily understood by comparing the latter with Fig. 3. O″ represents one of the horizontal rods which extend from N N to lugs, P, one of which is fixed on each side of the movable collar, S, which surrounds the hollow axis of the cutter wheels. R is a slide, on which P is supported, and T T are

Fig. 2

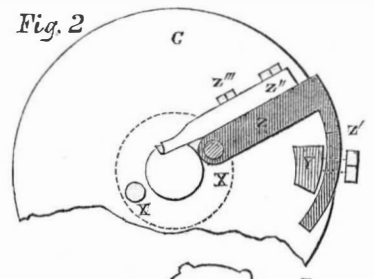
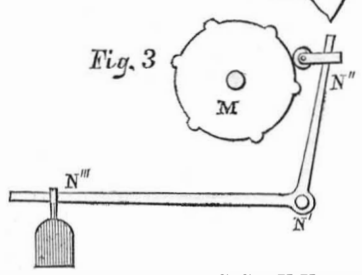


Fig. 3



bearings, which support C C. V V represent small guide rollers, which aid in supporting the work as it issues from the lathe. W W are india rubber springs, which hold V V in contact with the work. The material is supplied to the machine by inserting pieces previously split or sawed in suitable size, between the feed wheel, F, and the smooth rollers, G. By these rollers it is fed forward into the hollow axis of C C, subjected to the action of the cutters, and escapes at the other extremity, between the guide rollers, V V. The irregular form of the pattern wheel, M, by the device described results in giving a more or less regular longitudinal motion to the collar, S, which motion moves the cutters outward and inward, by means which will now be described:—

From the front side of the collar, S, project two short rods, S′ S′, into which are inserted screws, S″. The cutters, two in number, are shaped like the ordinary gouge employed in turning, and are mounted on pivots or centers, X X, Fig. 2. Z represents the tool and tool holder, which are free to rotate around X. Z′ represents a curved proje ction extending from the outer extremity of Z, which is perforated by a slot which extends obliquely through it. The screw, Y′, which is fast in Y, stands in this oblique slot, and as the collar, S, is moved, compels the tool holder and tool, Z, to swivel round on the centers, thus bringing the cutting edge closer to the axis of motion, or removing it further therefrom, according as S is moved. The effect of the whole is to make the position of the cutters dependent entirely upon the position of the rock shaft, N′, and this latter being entirely dependent upon the form of the pattern wheel, M, it follows that any number or form of bead desired may be produced.

We have seen the lathe in operation in this city, executing plain cylindrical and beaded work, as broom handles, &c., with great rapidity, and presenting, of course, absolute uniformity in the product.

For further particulars address Henry Edgarton, Baltimore, Md., or George W. Walton, Crook's Hotel, 80 Chatham st., New York.

Hæmatinone.

Under the name of hæmatinone, a kind of glass was in use among the ancients, for the purpose of making ornamental vessels, mosaics, &c. It has been found very abundantly in the excavation at Pompeii. This glass is distinguished by its beautiful red color. It is opaque, harder than ordinary glass, susceptible of a fine polish, of conchoidal fracture, and its specific gravity is 3·5. By fusion it loses its red color, which cannot be restored. Hæmatinone contains no tin, or any other coloring matter, besides sub-oxyd of copper. All attempts of the moderns to imitate it had entirely failed, until the successful result of experiments made by M. Pettenkoffer, who not long ago brought forward a method of producing the material in large quantities, so that with requisite precautions, it was alleged the material might be cast into plates of any size, and worked into articles of every description. It was generally anticipated that this discovery would furnish a clue to many of the processes of the ancients in the manufacture of colored glass, but the anticipation does not appear to have been realized.—*Exchange.*

Oil vs. Hydropathy.

We have on several occasions invited attention to the ancient practice of anointing with oil, and to the fact that oil makers and oil porters, whose clothing is presumed to be more or less oily, are often singularly free from contagious diseases which sweep off others. An exchange takes up the same subject, and remarks that in the East Indies, children are rarely washed with water, but they are oiled every day. A child's head can be kept much cleaner if oiled, than without it; and many young people with hectic cheeks would probably never know the last days of consumption, if their parents would insist on having their cheeks, back, and limbs anointed with sweet oil two or three times a week. The Hebrew physicians seemed to have considered oil as more efficacious than any other remedy. The sick were always anointed with oil, as the most powerful means that was known of checking disease.

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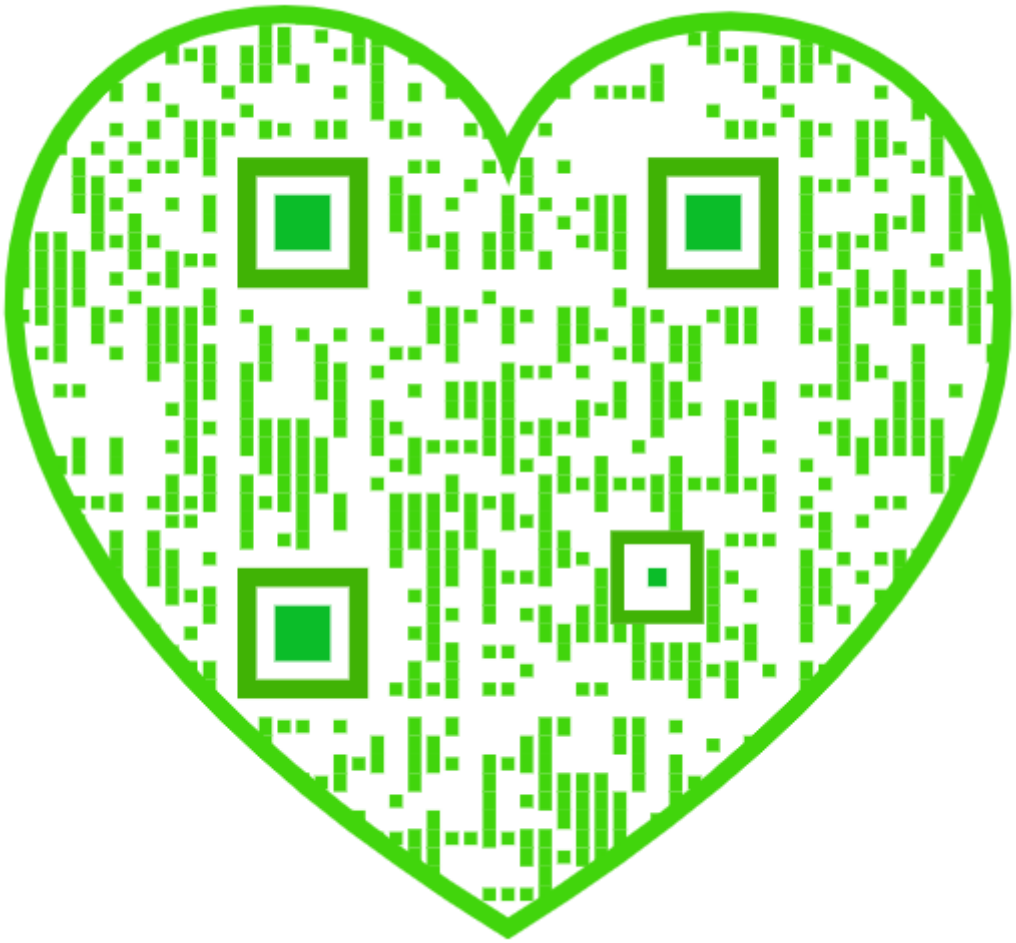

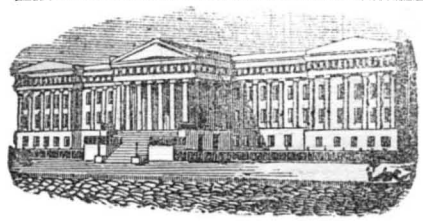

[Reported officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING AUGUST 25, 1857.

FILTER—Wm. W. Ayres, of Worcester, Mass.: I claim the combination of cylinders, B and C, with the spindle, S, when constructed with reception and discharge cavities, d f, openings, e g, and channels, m n m' n', arranged and operating substantially as and for the purposes set forth.

WETTING AND CUTTING PAPER—Moses S. Beach, of Brooklyn, N. Y.: I do not, therefore, claim broadly the wetting of paper by means of wet or moistened rollers applied to one side of the paper, and not to the other,

Neither do I claim broadly the cutting of paper by means of a saw-edged knife, whether the knife be attached to a stationary frame or to a cylinder, and whether projected against the paper by means of cam and lever or springs.

But I claim first, Simultaneously wetting or moistening both sides of the paper in the manner substantially as described.

Second, Leaving the paper dry at the point or line of cutting, substantially as described.

Third, Catching the knife when retired within the circumference of the cylinder, retaining it while so retired, and releasing it from the operation of cutting, by means of the catches, e f, the springs, j, and the tripping pins, l, in the manner substantially as described.

Fourth, Combining the cutting apparatus with the wetting cylinders or rolls, substantially as described.

MANUFACTURING HAT BODIES—Joseph Booth, of Newark, N. J.: I claim the rotating flat hurdle, having its perforated surface divided, substantially as set forth, in combination with a picking or bowing apparatus, and air exhausting apparatus, the whole constructed and operating substantially as set forth.

I also claim the arrangement of the fan shaft upon the spindle of the revolving hurdle, substantially in the manner and for the purpose set forth.

HERMETICALLY SEALING CANS—Wm. Borrman, of Cincinnati, Ohio: I claim the mode, substantially as set forth, of hermetically sealing cans by means of the central screw stem, c, and sheath, e, in the described combination, with the pliable lid, f g h j, nut, d, and gaskets i and k.

UMBRELLAS AND PARASOLS—Sheldon Canfield, of Derby, Conn: I claim the form and construction of the clasp, E, described, it being made of a single piece of thin sheet metal, so folded in the middle, either by a machine or otherwise, as to form on the under side of the clasp, two flanges, e and f, each consisting of a double thickness of the sheet metal.

I claim the clasp, as applied to umbrellas and parasols. I claim nothing else described as my invention.

PIERCING BLIND SLATS—John Carpenter, of Stonington, Conn.: I am aware that machines have been constructed for cutting the tenons simultaneously at both ends of blind slats, as in the machine patented by Hastings, Bumsey & Chamberlain, Feb. 20, 1855; and also for cutting the tenons and piercing the slats for wire staples simultaneously, as in the machine patented to T. G. Stagg, March 28, 1854; but I do not claim any device or action included in either of these machines referred to.

I do not claim the application of a sliding dog to clamp and hold the slat while another dog, or other device independent of this, is used for piercing the slats for the staple.

But I claim the application of the piercing points, h, to the sliding dog, so that the slat may be pierced for the wire staples by the same action as that by which they are held secure, for forming tenons thereon, as described.

SEPARATING ORE—Thomas J. Chubb, of New York City: I do not claim the broad process of agitating substances in a receptacle, for the purpose of causing the heaviest to settle to the bottom thereof, irrespective of the means specified and described.

Nor do I claim separating substances of different specific gravity by a current of air applied on the old and well known winnowing process.

Neither do I confine my improvement to any specific arrangement of mechanism.

But I claim effecting a separation of a thin layer of finely pulverized ore into layers or strata of different specific gravity upon a perforated bed, or its equivalent, by means of applying light minuet puffs of air up through the interstices of the said bed, and through a thin layer of ore evenly spread, and resting thereon, as described, for the purpose of gently agitating the said layer of ore, and floating the lightest substances therein to the top thereof, and allowing the heaviest substances therein to gravitate to the bottom of the said layer on the said bed.

[There are a number of channels formed by narrow strips of metal across the inclined perforated bed, and (the material having been previously assorted by screening, so that all the particles introduced at one time shall be of pretty nearly a uniform size,) by each of the puffs of air the dirt rises and again descends in lines nearly perpendicular to the face of the bed; but the heaviest particles being more likely than the light ones to leap over the strips of metal, it follows that, at the end of a certain period, the solid metal will be nearly all collected in the lower grooves, while the light dirt remains in the upper grooves. It is an ingenious and admirable improvement on the means heretofore in use for the purpose.]

SETTING SAW TEETH—Pearson Crosly, of Fredonia, N. Y.: I do not wish to be understood as limiting my invention to the special mode of constructing the stock, or of holding the two parts of the swage together, or the entire swage in the stock, as other and equivalent modes may be substituted.

I claim forming the acute angle of the acting face of the swage to bring the cutting edge of the saw teeth to a sharp angle by making the said swage in two parts, substantially as specified.

BRICK MACHINES—P. S. Devlan, of Reading, Pa.: I claim, in combination with a clay receptacle supplied by a positive feed, and a rocking or partially rotating mold wheel, H, the plungers, G and t, the first for pressing, and the second for delivering the pressed brick, the parts being so arranged as that said wheel will rock or roll from one plunger to the other, and be held in the manner and for the purpose set forth.

WASHING MACHINES—Hiram F. Everitt, of Benton, Pa.; I make no claim to any of the parts composing my machine, when separately considered.

But I claim the combination as described of the adjustable reel fluted concave, and swinging rubber, constructed, arranged and operating substantially as and for the purposes specified.

SELF-WAITING TABLES—Wm. B. Farrar and Jonathan H. Farrar, of Evans' Mills, N. C.: We make no claims to a table made with a central revolving part, C, as this is common.

But we claim the central revolving disk, C, when fitted down into the circular hole, a, constructed with a thin lip, F, projecting horizontally from the upper portion of its circumference, and with a rib of ring form projecting from its under side, and near its circumference, substantially as and for the purposes set forth.

[This enables the persons sitting around a table to serve themselves with great ease, and deserves an extensive introduction.]

PIN STICKING MACHINE—Thaddeus Fowler, of Waterbury, Conn.: I claim first, The endless chain with its racks, in combination with the flanged cylinder, (whether with or without the revolving hopper) when constructed, arranged and made to produce the result, substantially as described.

Second, I also claim the combination of the endless chain with the revolving hopper, when the whole is constructed and combined substantially as described.

SHIPS' BERTHS—Henry Getty, of Brooklyn, N. Y.: I claim providing at each end or side of a state room of a steamer or vessel, a pivoted bracket, d, which is capable of vibrating in the path of a circle a certain distance, and connecting the berth to said brackets through swinging vertical screw rods, g g, metal or rubber springs, t t, and hollow standards, b b, substantially as and for the purposes described.

[This saves passengers from being affected by the rolling and pitching of the ship, and thus prevents seasickness. In the day-time, when not in use, it can be turned up edgewise.]

WASHING MACHINES—Wm. M. Hammond, of Jonesville, Mich.: I do not claim either the tub or reciprocating follower to be any part of my invention, since they have been used, as in Wisners', and other improvements (patents)

Neither do I claim anything of the nature of floating balls, as the balls in my improvement practically do not float, and should be made of some heavy material.

Nor do I claim anything like rollers, conical or otherwise, requiring pivots upon which to turn, for the reason that the balls are a marked improvement, having no pivots either to rust, or wear out, or to injure the clothes.

But I claim the bed formed of loose weighted balls covering the tub bottom, in combination with the cellular disk rubber, arranged and operating substantially as and for the purposes set forth.

RENDERING TRUNKS WATER-TIGHT—Charles H. Hinckley, of Stonington, Conn.: I am aware that the expanding jointed clasp was patented by Sellers & Pennock, June 12, 1840, and that india rubber packing has been used in various forms, other than that of the inflated ribs for securing water-proof joints; and that separate tongued and grooved jaws or clasps for crimping in the material of the bag, and thus form a water-tight connection, and patented by Robbins & Allen, Sept. 7, 1852, but without the inflated ribs; but neither of these do I claim.

But I claim the application of the inflated casements or ribs, as described, composed of india rubber or other suitable material, to the sides of contact of clasps for bags or cases, so that by their yielding contact the clasp may be closed so as to be impervious to water.

HAY AND MANURE FORKS—Wm. Jones, of Speedsville, N. Y.: I claim casting the ferrule, B, upon, or otherwise securing it, firmly to the outer end of a socket, in which are slots for the reception of the tangs of the tines of a fork, to prevent lateral working, when in connection with a wedge, cast or otherwise formed, between the recesses made for the tangs, to prevent end play, and screws, a, for the securing of the tines, socket and handle to each other, substantially as set forth.

STEAM PRESSURE REGULATORS—Lucius J. Knowles, of Warren, Mass.: I claim supporting the disk, C, by concentric rings, I, and rods, p, in the manner substantially as set forth.

PROJECTILE FOR RIFLED CANNON—Theodore T. S. Laidley, of U. S. Army: I do not claim, of course, as my invention, the attachment to elongated shot or shells of a cylinder of wrought iron fastened to the body of the shot by imbedding its bottom or sides in the cast metal of the shot, the cylinder attached to the butt of the shot or shell, and its sides to project beyond.

Neither do I claim the arrangement of a belt or packing of soft metal which is to be forced out by the gas passing into certain vacant spaces between it and the main body of the shot.

But I claim the formation of a cast iron shot or shell with a wrought iron covering of a portion or whole, which is fastened to the main body of the shot at or near both ends, by imbedding one or both turned in ends in the cast metal of the shot or by means of dowels, pins or rivets imbedded in the cast metal, and joining the two metals, the body with the covering, firmly and securely, or by a combination of these methods, leaving an intermediate portion of the covering free to be expanded by the action of the gases of the discharge passing through certain channels or passages between the covering and the body of the shot made or left for that purpose.

I also claim making the wrought iron covering thicker at its rear end, which admits of annular spaces being cut into it to hold grease, or for the action of the atmosphere to keep the ball true in its flight as in the improved ball for muskets, and also throws the bearing parts of the projectile nearer the center of gravity, insuring greater accuracy.

WASHING MACHINE—Justin Loomis, of De Ruyter, N. Y.: I claim the tubular guide piece, P, forked braced, b b, joint, a, swivel pin, d, and socket, e, in combination with braces, B B, and the rubber shaft, S, constructed, arranged and operating substantially as and for the purposes specified.

CUPOLA FURNACES—Philip W. Mackenzie, of Jersey City, N. Y.: I do not claim the boshing or outside air chamber.

But I claim forming a continuous sheet of air as indicated at a' a', where it is brought in contact with the fuel, in combination with the elongated form and increased size below, a' a', where the blast enters the fuel.

HARVESTERS—Pells Manny, of Waddam's Grove, Ill.; I claim the method of constructing the fingers of the cutting apparatus of harvesting machines of two members, B and E, and securing them upon the finger bar in the manner as set forth.

I also claim the recesses, r and z, in the inner faces of the fingers, in combination with the supplementary inclined cutters, u and v, projecting above and below the sickle, substantially as set forth

SHIPS' CAPSTANS—Charles E. Marwick, of Portland, Me.: I do not claim a capstan having its barrel fitted to rotate either with or independently of a hand spike or wheel, as this is not new.

Neither do I claim the application of gearing to a capstan, for the purpose of increasing the power by which the same may be put in operation.

But I claim the combination of the key ring, D, the recessed lip, C, and the socketed head, E, as constructed, arranged together, and applied to the capstan barrel, A, and the driving shaft, F, of the multiplying gearing, and operated by means substantially as specified.

WATER VESSELS FOR HOT AIR FURNACES—William Moultrie, of New York City: I do not claim the placing of a water vessel within a furnace chamber simply, for the purpose of imparting humidity to the air therein.

Nor do I claim to have discovered the utility of vapor draft for the support of combustion.

But I claim the structure, location, and application of the water vessel, M, whereby either or both of said objects are attained, substantially as described, in connection with furnaces and other heating apparatus.

COOKING RANGES—Samuel Pierce, of Troy, N. Y.: I claim the combination of the recess, p, between the ovens, having a division plate therein open at the top, with the bottom flue, as set forth, so as, by the action of the draft of said bottom flue, to cause a circulation in said recess, p, in the manner and for the purpose described.

PHOTOGALVANOGRAPHIC PRINTING—Paul Pretsch, of Austria: I claim the peculiar adaptation of the photographic process to the production of metallic and other surfaces suitable for printing, and for various other useful and ornamental purposes, as described, or substantially similar thereto.

BORING MACHINE—Emmett Quinn, of Trenton, N. J.: I claim the combination of the sliding guide, a a, with the levers, f f, and timber carriage, C, operating as and for the purpose set forth.

BENDING MACHINE—Lewis Raymond, of New York City: I claim the combination of three rollers, convex and concave, substantially as set forth, so as to bend sheet metal transversely and longitudinally at one operation

In combination with the above, I also claim a supporting roll, located, arranged, and driven substantially as set forth.

GLASS FURNACES—Samuel Richards, of Philadelphia, Pa.: I claim the arrangement of the drying ovens, C, the flue, F F', and the endless carrier, I I I, and the chutes, M M' M" M"', in combination with the glass furnaces, in the manner and for the purpose substantially as described.

LOOMS—Edwin A. Scholfield, of Westerly, R. I.: I am aware that the star gears under a modified form have been used for changing the position of the shuttle box, and also the pattern chain which governs the order of succession of the harness, as in the patents of Samuel Eccles, of March, 1850, and Samuel and James Eccles, of August, 1852; but these are for totally different objects from that contemplated in this.

I do not claim the construction or use of star gears for any purpose except to drive a cam wheel to spring the harness in weaving.

But I claim the driving or revolving cam or tappet wheel, which acts to spring the harness or produce a shed in weaving by an intermittent or variable motion, by the use of star gears, substantially as above described.

WASHING MACHINES—Isaac A. Sergeant, of Springfield, Ohio: I claim first, The employment within a water-tight tub, B, of an adjustable rotating perforated platform or secondary tub, E, in the manner substantially as described.

Second, Providing the outer end of roller M, with a shoulder, n', of larger diameter than the body of the roller, substantially as and for the purposes set forth.

[In this machine the clothes are mounted in a rotating frame or open tub within the principal tub, and can be raised at pleasure to examine or arrange the same without stopping the machine.]

PACKING ROTARY ENGINES—Gerard Sickles, of Brooklyn, N Y.: I claim the application of loose metal rings, g g, in the manner substantially as described, to pack the revolving heads which carry the pistons to the stationary head of the cylinders of rotary engines and pumps.

[These rings are fitted cheaper than the usual packing, and are so arranged that the pressure of the steam makes tight joints thereby on the steam side of the pistons or revolving wings, but leaves the joint more or less loose, or open, and consequently frictionless, at the points which are at the moment on the exhaust side of the pistons. In other words, the packing is only tight when and where it is required to be tight.]

FENCE FOR POULTRY YARDS—Wm. P. Thomas, of White water, Ind.: I claim, first, The combination of the swinging frame, C D E E F G, with posts, A A, in the manner and for the purposes set forth.

Second, I claim the swinging board, F, in combination with the swinging frame, C D E E G, in the manner shown and described.

VIBRATING SHEARS—John Toulmin, of New Worcester, Mass.: I claim hanging the movable blade of a pair of shears by two adjustable center pivots upon an adjustable pillar block, substantially in the manner described, and for the purpose of so adjusting the movable blade of said shears as to give it the most effectual shearing position in relation to the stationary blade, as set forth.

CLAMPING LOGS IN SAWING MACHINES—Stephen Woodard, of New London, N. H.: I claim holding the wood to be sawed by means of the described arrangement of holders, X, acted upon by the toggle joints, Z, weighted at their centers, or an equivalent arrangement, essentially in the manner and for the purposes fully set forth.

WATCH KEY FINGER RING—Elihu Bliss, of Newark, N. J.: I claim a watch key and finger ring combined, substantially as set forth.

INKSTAND—Thomas Robjohn, of New York City: I claim the arrangement for flexing the elastic diaphragm by so attaching a mechanism in connection with a cover, for the ink cup, that the opening and closing thereof shall effect the raising or discharge of the ink or other fluid into or from said cup, as described.

WASHING MACHINE—Abram Wood, of Camden, N. Y.: I claim the hinging of the board, F, at G G, so that the disk, C, and its shaft, may be conveniently raised out of the tub and thrown back while the clothes are handled, and again conveniently let down by the operation, and by which arrangement the whole machine, including the bench, may be lifted and moved from place to place, as described, the whole being arranged and combined substantially in the manner set forth.

SEWING MACHINES—Wm. Wickersham, of Boston, Mass. Patented in England Dec. 29, 1854: I claim, first, A fast stitch made by one thread which is formed by having the loop or double of the thread pass through from one side of the cloth to the other and back again in another place to the first side of said cloth, and around the same thread of which the loop is formed by means of a shuttle carrying said thread through said loop, substantially as specified.

Second, I claim a thread guide with a notch or opening, e, in one side of it to receive the thread, and formed and arranged substantially as described, so that the thread may pass into it, when said thread is to be guided into the eye or hook of the needle and pass out of said notch in the thread guide at other times.

Third, I claim the use of a double hooked needle, as described, in taking the thread both ways through the cloth one way or up through the cloth, by means of one hook, and the other way or down through the cloth by means of the other hook of the same needle, all substantially as above described.

SEWING MACHINES—Wm. Wickersham, of Boston, Mass. Patented in England, Dec. 29, 1854; I claim, first, The method of taking up the slack thread above the cloth by means of the shuttle—that is, when the needle descends after having taken the thread up through the cloth, and to its greatest distance above said cloth, drawing down through the cloth the end of the thread connected with the shuttle by means of the shuttle receding from the needle as the needle descends, thereby preventing the liability of the thread getting under the point of the needle, as said needle passes down into the cloth by thus keeping said thread straight or nearly so until said needle point is sufficiently near said cloth that there is no further liability of the thread passing under it.

Second, I claim the formation of a seam of one thread which cannot be unraveled, of stitches each of which is made by having the loop or double of the thread passed through from one side to the other of the cloth, and back again in another place to the first side of said cloth, and a loop formed by means of a hook needle, and then by having the same thread of which said loop is formed passed through said loop, and the loop drawn up to the cloth around the thread thus passed through it by means of the shuttle as specified.

RAKES FOR HARVESTERS—J. W. Brokaw, (assignor to Warder, Brokaw and Child,) of Springfield, O.: I claim the arrangement of the spring guide, P, and double guide bar, R, in combination with the rake head, I, carrying friction rolls, h and h', constructed, arranged and operated in the manner substantially as set forth

I also claim the friction rolls, g, in combination with the sleeve, f, rake head, I, and guide rod, o, as arranged and operated for the purposes set forth.

SEWING MACHINES—Henry Behn (assignor to himself and Thos. Sewall) of New York City: I claim the specific looping device herein set forth, consisting of two pointed bars, the one moving in a plane above the plane of motion of the other, and operating in combination with the needle in such manner, that the loop is formed and held open by bending the thread out of a straight line in opposite directions, as described.

SEWING MACHINES—Samuel Larkin, (assignor to Wheeler & Wilson Manufacturing Company,) of Bridgeport, Ct.: I am aware that springs or spring frictional brakes of various descriptions have been used to control the tension of the thread in sewing machines, and therefore I do not claim the employment of a spring for such a purpose.

Nor do I claim any arrangement or combination of a spring and other devices which operates upon a different principle from the combination devised by me.

But I claim a spring force as constructed, substantially as herein set forth, in combination with a spool spindle, or equivalent means of supporting the spool.

CULTIVATORS—C. H. Sayre, of Utica, N. Y., assignor to himself and Saml. Remington, of Ilion, N. Y.: I claim a combined horse hoe, and double mold board plow, constructed, arranged and operated substantially as set forth.

FOLDING PAPER—C. P. Wiggins, A. H. Nordyke and Benj. Strawbridge, of Richmond, Ind.: We claim, first, The combination of the cam wheel, L, with lever H', pinion g', shaft g, drum G, cords c c', and blade C for purposes shown.

Second, The combination of the cam wheel, L, with levers, H H', pinions f' g', shafts f g, and drums F G, for the purpose of producing an alternate movement of blades C D, as set forth.

Third, The combination of jaws or clamps, N O, and lever P, with blade D, to prevent retraction of the paper.

BOOT CRIMPS—Wm. W. Willmott (assignor to himself, Amos H. and Chas. H. Brainard) of Boston, Mass.: I claim, first, The device herein described for operating the pincers, consisting essentially of the block, K, the screw, L, the spring N, ratchet O, and pawl p, operating in the manner and for the purpose set forth.

Second, The device herein employed for the purpose of securing the jaws to the stand, consisting essentially of the slit g, with its shoulders i, and the tenon h, with the shoulders, k, operating in the manner set forth.

RE-ISSUES.

GLASS JOURNAL BOX—Edward Campbell, of Columbus, O. Patented Aug 21, 1855: Having thus fully described my new compound journal box, I wish to be understood as not claiming the union of glass and iron or other metal while the former is in a plastic state, and the latter highly heated to form a union between them.

But I claim as a new manufacture a journal box composed of a metal shell or body, and anti-friction lining surface of vitreous material, when said vitreous material is combined with its metal back, substantially as and for the purposes set forth.

REGULATOR FOR WIND WHEELS—Joseph Dunkley, of Carrollton, Mo. Patented Jan. 30, 1857: I claim, first, The combination and arrangement of the air passages, F, with the peculiar devices herein fully described for the purpose of making a self-regulating wind wheel as set forth.

Second, I claim the swinging wing, g, and slide l, arranged as set forth, and operating in the manner described.

Third, I claim the peculiar arrangement of slats s, cord d, and weight c, when operated in the manner and for the purpose set forth

OVENS—Wm. E. Treadwell and Wm. Hustace, executors of E. Treadwell, deceased, late of New York City. Patented July 19, 1853: What is claimed as the invention of Ephraim Treadwell is, first, The combination of flues and furnaces, substantially such as are herein before specified, with an endless apron or its equivalent, substantially in the manner before described, whereby the amount of heat imparted to either side of an apron or chain may be regulated independently.

Second, In combination with an endless apron and oven or their equivalents, discharging and charging apertures, located substantially as before set forth, in such manner that dough may be charged, and withdrawn in lines, perpendicular or nearly so to the line of motion of an endless apron

STEAMBOATS—John Schaffer, of West Manchester, Pa. Patented Oct. 21, 1855. I claim the drum C, on the shaft of the capstan, B, as arranged, the capstan being steam driven by geared shafting connecting it with the "little nigger," and the whole being combined and made operative through the pulley I, substantially in the manner and for the purpose described.

DESIGNS.

STOVES—Thomas Barry, of New York City. Six Patents.

STOVES—Samuel H. Ransom, of Albany, N. Y Six Patents.

CLOCK CASE FRONTS—Pietro Cinquinni, of West Meriden, Ct.

[This is a very elegant and chaste combination of scrolls, vines and basket.]

BRICK—G. W. Sholl and Chas. Stewart, of Cincinnati, Ohio.

STOVES—Thomas D. Worrall, of Lowell, Mass.

ERRATA.—In the List of Claims issued on the 11th of August is one to Jesse Shilling, of Troy, N. Y. The official report to us was incorrect; it should have read Jesse Shilling, of Troy, Ohio.

An Interesting Patent Decision.

In answering questions on certain law points referred to that functionary by the Secretary of the Interior, the Attorney General has rendered the following as his opinion, viz.:—

1. The payment of a duty upon a patent or caveat to the credit of the Treasury is not a pledge or deposit of the money, but an absolute and unconditional payment.

2. If the patentee or caveator afterward demand the money to be repaid to him, he must show that his demand for it is founded in some law, within whose terms he can bring his case distinctly and clearly.

3. There is but one provision in the act of July, 1836, authorizing a duty once paid to be refunded, and that provision is found in the seventh section.

4. That sentence authorizes twenty dollars to be returned, not to a caveator nor to one who has made an incomplete application, but only to one who has made an application which is perfect enough to be examined, and which, in point of fact, has been examined and rejected.

5. It follows that a party who merely files a caveat, paying the legal duty of twenty dollars, cannot withdraw the caveat and demand a return of ten dollars.

The Hoosic Tunnel.

The construction of this tunnel through the Green Mountain ridge, to facilitate connection of Boston with the West, has been brought to a temporary stand-still, in consequence of the contractors not receiving aid which had been expected. They have penetrated the mountain 1,030 feet—720 feet from the eastern end, and 410 feet from the western end.

Franklin Institute.

We are informed that this old and respectable institution is obliged to omit its usual annual exhibition this year, for want of a suitable building in which to hold it.

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Sugar and the Sorghum.

We have received from Dr. A. A. Hayes the following abstract of an interesting paper read by him on the above subject before the Scientific Association at Montreal:—

So rapidly has chemical science progressed of late, that the term "sugar" has now become a generic name for a class of bodies with the most marked diversities of sensible characters and composition. We have sugars which are sweet, others which are slightly sweet, and some destitute of sweetness; some are fermentable, others do not undergo this change; some are fluid, more are solid.

Adopting cane sugar as the most important kind from certain inherent qualities, we find its sources abundant, but not numerous. So far as observation has extended, its production by a plant is definite; a change of locality, even when accompanied by a marked change in the habit of the plant, does not alter essentially the nature of the sugar it pro duces. Thus the cane of Louisiana rarely matures and is an annual, while in the soil and climate of Cuba, it enjoys a life of thirty, or even sixty years. The juice of our southern plant always contains more soluble alkaline and earthy salts than is found in the cane of Cuba, but its sugar is secreted as cane sugar. The juice of the sugar beet, of watermelons, and a large number of tropical fruits, the sap of the maple and date palm, afford cane sugar. In these juices and saps, when concentrated by desiccation in the cells of the plants, it always appears in regular, brilliant crystals, of a prismatic form, clear and colorless; distinctly indicating a vital force in the plant, separating it from other proximate principles and leaving it in its assigned place pure.

The class of sugars next in importance includes, under the general term Glucose, a number of sugars having varied characters, which should be separately grouped. Among them are the sugars of fruits, seeds and grasses; those produced in the animal system, and the artificial sugars made from starch, grains and sawdust. The varieties of glucose are both solid and semi-fluid. When solid the organic tendency to rounded surfaces is generally seen. The semi-fluid forms often manifest a disposition to become solid on exposure to the air, and they then experience a molecular change, which produces crystals having new relations to polarized light and different physical and chemical characters.

Individuals of the class are easily distinguished from each other, and most clearly and remarkably from cane sugar. The plants producing the natural glucose sugars mature their cells as perfectly as those producing cane sugar, and the secretion can be found as distinctly isolated from other principles as cane sugar is, even when the glucose is semi-fluid. Hence we are able to determine by microscopical observations, aided by chemical tests, the presence and kind of sugar in the tissues or sap, of a plant, often without incurring the risk of change of properties through the chemical means adopted for withdrawing the sugar. The *Sorghum vulgare*, or sacharatum, belongs to the tribe including grasses. The unsuccessful attempts made to crystallize sugar from the juice of the Sorghum, produced in different climates of our country last year, indicated that it contained no cane sugar, or that the presence of some detrimental matter in the expressed juice destroyed the crystallizable character of cane sugar. My observations commenced after I had obtained several specimens of the Sorghum, and have been continued on the semi-fluid sugar, likewise from different parts of the United States, with uniform results.

When a recent shaving of the partially dried pith of the matured stalks of the Sorghum is examined by the microscope, we observe the sugar cells filled with semi-fluid sugar. After exposure to air it is often possible to distinguish some crystalline forms in the fluid sugar. These grains, after being washed, cease to present a clear crystalline character, and have the hardness and general appearance of *dry fruit sugar*. The most careful trials I could make failed in detecting cane sugar in any samples of the Sorghum stalks, or in the samples of sugar, including one made by Col. Peters in Georgia, prepared under the most careful management. I must therefore conclude, that the Sorghum cultivated in this country does not secrete cane sugar or true sugar; its saccharine matter being purely glucose in a semi-fluid form.

Pearl Muscles.

MESSRS. EDITORS—In No. 50, this volume SCIENTIFIC AMERICAN, I noticed a communication with the above heading, from E. D. B. Perhaps I can partially answer his inquiries. The muscle with a thick shell, (purple inside) is, I think, a species of the *Unio*, several varieties of which are found in the streams of Ohio, and no doubt of Wisconsin, and other Western States. The thin shell belongs to the *Anadonta*, or toothless. About the year 1843, the Farmington Canal (now a myth) was still in use in the city of New Haven, and among other productions of that noted water channel were the *Unio* and *Anadonta*, in considerable numbers. Learning that pearls were to be found in the *Unio*, I was induced to search for them, not for their pecuniary value, but only as specimens. Upon one occasion, when a portion of the canal had been drawn off, I gathered and opened about a hundred of the *Uniones*—these were from three to four inches in length, and about two in breadth—and was rewarded by finding ten pearls, in size from a pin's head to a pea, the majority rough and unfinished. I enclose you the largest one, and one of the small ones. You will observe that the color is pink or purplish, and similar to the inside lining of the *Unio*. Now, I think (and the idea is not new) that the nucleus of the pearl is some particle of sand, gravel, or other insoluble matter, which has accidentally fallen within the valves of the shellfish, and which cannot be dislodged by it. To relieve the irritation occasioned by its sharp angles or edges, the animal gives it a succession of coats of the same secretion with which it lines its own shell. Hence I think we may regard it as a fixed law, that the color of the pearl will be similar to the inside of the shell in which it is found. No white pearls, then, will be found in the purple *Unio*.

Again, will any pearls be found in the shellfish of sluggish and muddy streams? The nucleus or insoluble particle is wanting. (Will E. D. B. please tell us the character of the creek which he mentions?) The bottom of the Farmington Canal was sand, gravel and sedimentary matter, more or less of which was stirred up by the passage of every canal boat; here were the particles, and the disturbing cause which might have introduced them.

Whether the pearl-producing muscles of New Jersey are identical with those to which E. D. B. alludes, I have no means of knowing, but I may suggest to him not to spend much time in searching for pearls for profit, but to turn his attention to employing the shells of the *Unio* for some of those purposes for which the mother-of-pearl is now used, and in association with which various articles might be elegantly ornamented.

W. J. W.

Yaphank, L. I., August, 1857.

[One of the specimens sent us by our correspondent is about the size of a pea, of light pink color, and not perfectly round, but nearly so; the other is not much larger than the head of a large pin, and is less perfect than the large one. We think W. J. W. is correct in his theory that the pearls found in muscles will correspond in color with the shell by which they are surrounded, and are under obligations to him for his brief but clear article, which will be of great interest, we presume, to a very considerable number.

Velocity and Colors of Lightning.

The lightning of two classes does not last for more than one-thousandth part of a second; but a less duration in passing than one-millionth part of a second, is attributed to the light of electricity of high tension. In comparison with this velocity, the most rapid artificial motion that can be produced appears repose. This has been exemplified by Professor Wheatstone, in a very beautiful experiment. A wheel made to revolve with such velocity as to render its spokes invisible, is seen for an instant, with all spokes distinct, as if at rest, when illuminated by a flash of lightning, because the flash had come and gone before the wheel had time to make a perceptible advance. The color of lightning is variously orange, white and blue, verging to violet. Its hue appears to depend on the intensity of electricity and hight in the atmosphere. The more electricity there is passing through the air in a given time, the whiter and more dazzling is the light. Violet and blue colored lightnings are observed to be discharged from the storm clouds high in the atmosphere.—*Exchange.*

[We have always believed in the great velocity of ordinary lightning on the authority of Prof. Wheatstone's experiment alluded to above, and believed that although the light of a flash appeared to remain for a considerable period, it was really instantaneous—that, in short, the time of its remaining visible was an optical illusion—until one night, we took some pains to investigate the matter during a heavy storm. We could not well see the motion of the balance wheel of a watch, but the pendulum of a mantel clock was observed to make, in some cases, as many as three distinct vibrations. The Professor's experiment must not be understood as applying to all varieties of these natural discharges of electricity.

Castor Oil.

The cultivation of the Palma-Christa plant, which produces the seeds from which castor oil is pressed, has been practiced to a limited extent in this country, particularly in Illinois; but the demand has not been large enough to warrant extensive planting. The plant does not afford as great a yield in Mississippi as it does nearer the northern limit of its growth, which is about the latitude of 40°. M. Berris, a French chemist, declares that this oil is applicable to a great many industrial purposes to which it has not heretofore been considered applicable. He says:—

"By distilling castor oil upon concentrated potash, the sebacic acid and caprylic alcohol are extracted as separate products, which may be turned to good account. The sebacic acid, having a high melting point, may be employed, instead of stearic acid, in the manufacture of candles, and if it be mixed with stearic acid, the hardness and quality of the candles are greatly improved, and in appearance they resemble porcelain. It is possible to use caprylic alcohol in all the purposes to which ordinary alcohol is put, particularly in illumination, and in the composition of varnishes, and from it certain other compounds may be derived, of remarkable odor, similar to those which are at present largely used in commerce."

The farmers in Algeria can produce from a given quantity of land three times as much castor oil as they can olive oil, both of which productions afford good compensation to the cultivator.

Amylene, the New Anæsthetic Agent.

Dr. Snow, in a paper read before the Medical Society of London, has directed attention to amylene as an anæsthetic agent, and numerous trials of this substance for producing insensibility have been made with satisfactory results, the relative advantages and disadvantages of the article being as follows:—In regard to its odor, it is more objectionable than chloroform, but much less so than sulphuric ether. The odor of any volatile substance is, however, no longer perceived after a patient begins to inhale. In respect to its pungency, it has a great advantage over both ether and chloroform, being less pungent than either of them. Thus, while the patient, especially if a female, often complains of a choking feeling and want of breath in commencing to inhale chloroform, and two or three minutes are lost before the vapor can be inhaled in any useful quantity, she can inhale the amylene of full strength within half a minute from commencing, and the operation may generally be begun within three minutes. In the amount which suffices to produce insensibility, it is intermediate between chloroform and ether, chloroform having the advantage. Amylene is superior in preventing pain with a less profound stupor than that occasioned by the other agents, and in the ready waking and recovery of the patient.

Does Sunshine tend to Extinguish Fire?

The common opinion that the sun shining on a fire tends to extinguish it, and that consequently the embers must be shaded, if we would preserve them alive in a fire place, was made the subject of experiment in the year 1825 by Dr. Thomas McKeever, of England, and the results seemed to show a real foundation for the opinion that solar light does actually retard the process of combustion. These results were copied by the contemporary scientific journals, and even the great German chemist, Leopold Gmelin, in his *Handbook of Chemistry*, announces Dr. McKeever's conclusions, without expressing any misgivings in relation to their accuracy. Sunshine is an agent which is certainly capable of producing very remarkable effects; but the disagreement of this with other facts, has recently led Dr. John LeConte, Professor of Natural Philosophy in the South Carolina College, to repeat the experiments of McKeever, but using greater care; and the results obtained, as detailed by him at the late meeting at Montreal, tend to overthrow the idea, and prove that light has no influence whatever on the rate of combustion.

The fire employed in both the sets of expements was simply a wax candle. McKeever found it to burn about 12 per cent faster in the dark; but LeConte finds the light of the sun, even when concentrated by a large lens, produces no effect except by heating. If the air in the dark be heated to the same extent, and the air in each case be kept equally quiet, the candle burns at precisely the same rate. McKeever's experiments indicated that the candle burned from 5 to 11 per cent faster in the dark than in common sunshine. He supposed that the chemical rays exercised a deoxidizing power which, to some extent, interfered with the rapid oxydation of the combustible matter, and by trying the candle in different parts of the colored spectrum (produced by decomposing a ray of light in passing it through a prism,) his experiments appeared to indicate that a taper burned more rapidly in the red than in the violet extremity of the solar spectrum.

The whole subject cannot as yet be considered definitely settled, as the recent paper is regarded as merely preliminary to a more thorough experimental investigation, which Dr. LeConte proposes to undertake during the next twelve months. It is obvious that these researches have a practical bearing.

Wrecks on the Bahamas.

From January 1, 1856, to May 9, 1857, forty vessels were lost on the Bahama Banks. Commerce has suffered by these disasters, in seventeen months, to the amount of $2,609,800. Governor Bannerman, in a recent State paper, asserted that a large proportion of the wrecks were the work of design. He roundly asserted that, in a majority of instances, vessels were run ashore by their masters, with the understanding that they should share the proceeds of the wreck with the wreckers; and this practice, he said, was most common with American ship-masters. If his statement—founded on official information—was correct the matter should at once be made the subject of official inquiry by the United States Government.

New Sloop of War.

Proposals from ship-builders will be opened by the Secretary of the Navy to-day for the construction of a steam propeller sloop-of-war. The object of the government in contracting for this ship, and having her built outside the navy yards, is stated to be, "to obtain the best ship-of-war the mercantile marine can produce." When this contract is completed, it is supposed that another of the five sloops ordered by the last Congress will be let out. The competing ship-builders object to their models and plans being passed upon by the naval constructors in the employ of the government, who are utterly opposed to building a war ship except in a government yard.—*New York Tribune, Aug.* 24.

The University of Virginia, it is stated, has devoted fifteen hundred dollars to the preparation of a gymnasium.

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Propellers.

Whittaker's "Improvement in Side Screw Propulsion" has been introduced in a propeller lately launched at Keyport, N. J. The hull is 110 feet in length, 28 in breadth, and six feet deep. The engines are manufacturing in Jersey City, and it is expected the boat will be in running order in one month from the present time. The persons interested in the affair believe that side propellers, with high pressure engines, are much more economical and better than paddle wheels and low pressure engines. The experiment has been previously tried on the Lakes with good results. Capt. Whittaker's invention was illustrated a short time ago in the SCIENTIFIC AMERICAN.

E. Barrows' rotary engine, which has been several years successfully used on small experimental boats, (one of which, the *Rotary*, a side wheel steamer some sixty feet long, was employed last summer in the Coast Survey,) has lately been constructed on a considerably large scale and applied to a propeller intended to form the first of a line of such vessels to ply between this city and New Bedford. She has made several successful trial trips, running under different circumstances, pressures, &c., to test her capacities; and high hopes are entertained that the engine will prove not only more manageable and less troublesome to keep in order than ordinary reciprocating engines, but considerably more economical of fuel. We shall probably recur to this subject when she is regularly running. The American and foreign Patents for Barrows' invention were obtained by us. The engine has been illustrated in the SCIENTIFIC AMERICAN.

The Corliss engine (working very expansively with rotary and very quick-shutting valves) has been for several months performing admirably on the propeller *Curlew*, a large vessel plying between this city and Providence. This vessel is said to make better time with a considerably smaller consumption of fuel than any other vessel of her size and model in these waters. She is the first example of the adaptation of these highly popular engines to marine purposes.

Hewit's Pump.

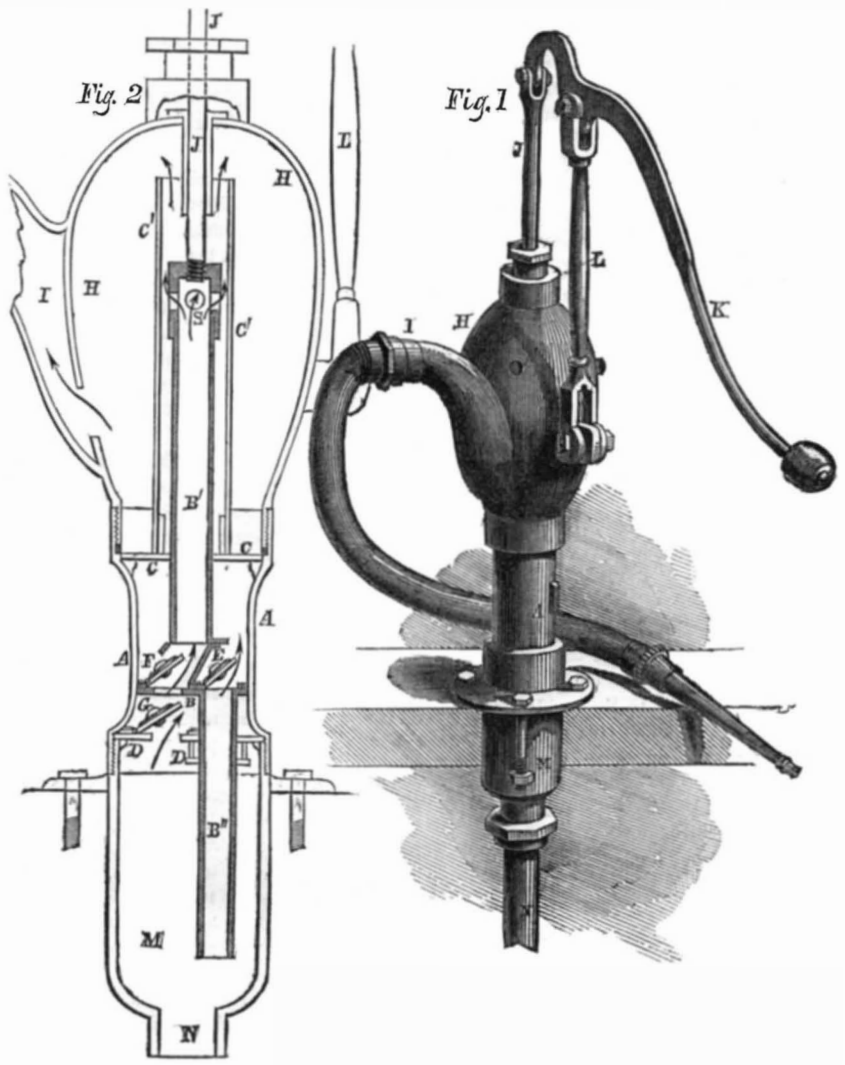
This pump is so constructed that the fluid travels in an almost direct line from the induction to the eduction passage. It is a reciprocating pump, with valves in the bucket, and is, in these principal features, similar to a very large class of pumps in common use.

Fig. 1 is a perspective view, and Fig. 2 a vertical section of the pump complete. A is the body or barrel. B is the movable bucket, B′ a tube perforated at the top, attached to B, and by which the latter is connected to J, the pump rod. C is a fixed horizontal partition above, through which B′ plays tightly, and C is a tube, larger than B′, and surrounding it. D is a lower or fixed bucket, through which plays tightly a tube, B″, fixed to the lower side of the movable bucket, B. There are two valves, E and F, hinged on the upper side of B. E simply opens and closes the tube B″, but F is faced with leather on both sides, and when it is thrown up into its highest position it meets the ledge represented. On the fixed bucket, D, is also a valve, G, opening upwards. H represents the upper reservoir, receiving vessel, or air chamber, and I the discharging pipe. J is the pump rod, working through suitable packing, and through a long packing tube, as represented, which latter is fitted tightly to the metal of H, so that any leakage through the stuffing box must come from the bottom of said tube thus aiding to retain a little air in the top of the air chamber, even if the stuffing box is quite leaky. K is the lever by which the pump is worked, and L is an upright link, which serves as a fulcrum therefor. M is a lower or receiving chamber, and N is the tube through which the water is received.

Operation.—When, by elevating the loaded extremity of K, the bucket, B, is depressed, the valve, G, shuts, and the pressure of the water below B, forces F to rise, and by meeting tightly the ledge referred to, it prevents the flow of the water into the portion of A above B, and compels it to rise through the tube, B′, and be discharged through the holes, S, near its top. The same movement, by generating a partial vacuum in the upper portion of the cylinder, A, causes the valve, E, to rise, and allow water from M to rise and fill it.

When the motion of K, and consequently of B, is reversed, the valves, F and E, close, and the water in the upper portion of the cylinder or barrel, A, is compressed and compelled to rise through B′, while the partial vacuum formed below B, causes the valve, G, to rise,

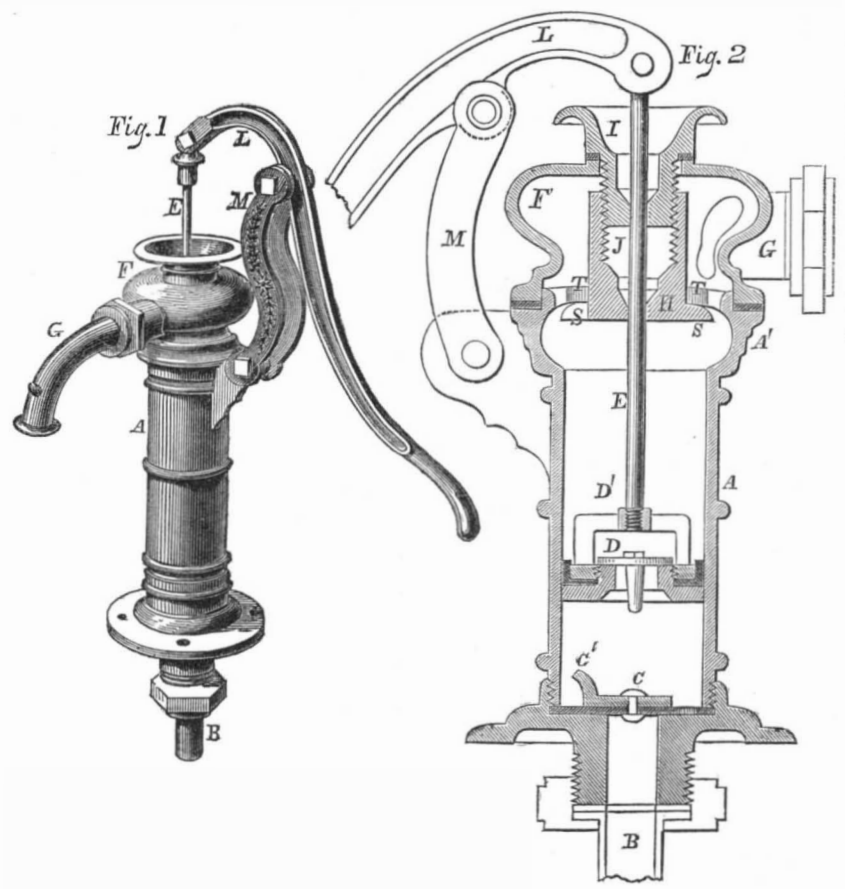
HEWIT'S DIRECT MOTION PUMP.



and allow the water to rise from M to fill the space. Whichever direction, therefore, the bucket, B, is moved, the water rises from N into M, and proceeds almost directly therefrom, either through B′ or D, to be discharged from the tube, B″, and finally through the pipe or goose neck, I.

The pump was patented May 19, 1857. For further information address the inventor and patentee, Silas Hewit, Seneca Falls, N. Y.

LEWIS' SUCTION AND FORCE PUMP.



The pump represented in the accompanying engravings is remarkable principally for strength, cheapness and durability. It is a reciprocating pump, with valved bucket, like many of the most successful pumps previously in use, but it is secured together without the necessity for scarcely a single bolt.

Fig. 1 is a perspective view from a daguerreotype. Fig. 2 is a section copied from the Letters Patent. A is the barrel, and A′ an extension which is of larger diameter, and carries a flanch projecting outwards, and a broad horn or flanch, T, extending partially around its interior, and projecting inward. B is the suction pipe secured by a screw coupling. C is the lower valve, hinged with leather, which latter is fastened by screwing down the body upon the flange which forms the base. C′ is a horn which prevents its opening too far. D is the upper valve which guards the opening in the movable bucket. D′ is a guard which prevents D rising too high, and also confines the cup-leather which forms the packing of the bucket. E is the pump rod. F is a top-piece resting on a leather or rubber joint on the flange, A′. This is held down very firmly by the gland, I, which is fitted with a tight joint on the top of G, and which is tapped into H, so as to form the stuffing box, J, as represented. From the lower edge of H extend two stout horns or partial flanges, S S.

On fitting up the pump, the barrel A is secured in place, the bucket D and pump rod E inserted, and the piece, H, slipped over the latter. The piece, H, is turned partly around, so that the parts S catch under the parts, T, and then supporting it by raising the bucket and guard by the rod E to its highest extent, the part F is fitted on, and the part I inserted and screwed into J as tightly as possible. The whole is now firm without other fastenings, the construction being highly ingenious and economical.

G represents the passage through which the water is discharged. L represents the handle, and M the fulcrum. In all points relating to the operation, the pump is identical with all the pumps of this class.

It was patented June 23, 1857, by C. N. Lewis, of Seneca Falls, N. Y. For further particulars, address the assignee, G. C. King, of the same place.

Relation of Inventions.

The London *Critic*, noticing a recent invention of apparently little consequence, uses the following well chosen simile:—

"Let every development of thought, and every adaptation of thought, be encouraged and welcomed, even though its ultimate uses—we mean those uses which the man of the day can see—were as distant as gravitation and lunar distances from the conic sections of the Baconic school of geometers, which were ready to hand when wanted. Those who decry the highest stone because it supports nothing, are fortunate in one point—they will always have something to decry. Those who are busy in raising the next stone, will find them another job at the very instant the old one is finished."

Printing Textile Fabrics by Light.

The chromatic photo-printing process is an ingenious mode of printing textile fabrics, by the chemical action of light. It is designed to employ the chemical agency of light in dyeing or staining textile fabrics; the cloth, whether wool, silk, flax or cotton, being first steeped in a suitable solution, then dried in the dark, and subsequently exposed to the action of light—those parts which are to form the pattern being protected by pieces of darkened paper, or some other suitable material, attached to a plate of glass. When the desired effect is produced—the time for which varies from two to twenty minutes, according to the process, the fabric is removed in order to undergo a fixing operation.

Steam Wagon.

In the course of the present week it is expected that the steam wagon in course of construction at Sacramento City will be ready for the trial trip. As we have already stated, a joint stock company has been organized for the construction of several of these wagons, to be placed on different routes in various parts of the State. Every one who has seen the operations of the model steam wagon must have been convinced of its utility.—*San Francisco Globe, July* 20.

Use of Strychnine in Distilleries.

The physician of the House of Correction, at Lawrence, Mass., reports it almost impossible to treat delirium tremens successfully now, in consequence of the utter prostration of the nervous system of drunkards by the strychnine so generally used in the manufacture of liquors.

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Scientific American.

NEW YORK, SEPTEMBER 5, 1857.

The End of our Twelfth Year.

The present number of the SCIENTIFIC AMERICAN closes this volume, and brings us to the end of our Twelfth Year.

As editors and publishers, we have every reason to feel satisfied with the results of the past twelve months, yes, for the past twelve years. The number of our readers has been considerably increased within the last year; and we have cause to believe that we have been the means of doing some good in the world. From every direction we have received the most emphatic assurances of benefits positively conferred by our publication; every subscriber who expresses an opinion, states that he reads the SCIENTIFIC AMERICAN with increased satisfaction.

In the world of science perhaps the greatest event of the year has been the construction of the cable for the Atlantic Ocean Telegraph. We had hoped to close our volume with a record of the successful telegraphic union of the Old and New Worlds. An accident has, however, temporarily postponed the consummation of that extraordinary enterprise; but the history of its success will, we trust, be written in our next volume.

The Ocean Telegraph, although it rises above all other scientific enterprises of the year, is not, however, the only great thing attempted. Our inventors have been as busy as bees. The number of new inventions produced in this country during the past year, exceeds, by full one-third, that of any preceding year. And the demand for labor-saving machinery and new articles of manufacture was never so strong as at present. The value of patent property is greater than ever before, although the number of patents granted has wonderfully increased. Five years ago we congratulated our readers upon the then unusual activity of the United States Patent Office, in issuing seventeen patents per week. But now it is not uncommon to see a weekly list of seventy patents granted. We take pride in believing that the SCIENTIFIC AMERICAN has contributed, in no small degree, to this increase and development of new inventions. Their numerical augmentation is indicative of great progress in the realm of thought, for inventions are not the work of the hands, but of the mind.

Our arrangements for the forthcoming year are such as cannot fail to please every reader. Volume XIII will be printed upon new type; improvements will be made in the general appearance of our publication; and its contents, we are sure, will be found more interesting and necessary to the subscriber than they have heretofore been.

We most earnestly desire to increase the circulation of the SCIENTIFIC AMERICAN during the forthcoming year. Already our paper enjoys a far greater distribution than any other publication of the kind in this or any other country. But there are many active and vigorous minds that have never read or known our journal; they would be benefited by its teachings. But how shall we reach them? If the many friends who now surround us will lend their assistance, the work may soon be done. Reader, show our paper to your friends and neighbors, allow them to peruse it, and invite them to subscribe. You shall receive our thanks for this service, and no doubt those whom you influence will also have reason to thank you.

Persons who will volunteer to take a little extra trouble in inviting attention to the SCIENTIFIC AMERICAN, will receive a handsome pecuniary reward. We have set aside the sum of one thousand five hundred dollars for this purpose, to be paid, in suitable sums, for the fifteen largest lists of subscribers sent in to us between the present time and the first day of January next. Read the announcement of our prizes in another column. To the enterprising this is a grand opportunity.

With the present number of our paper we send to each subscriber an *extra sheet*, containing a carefully prepared *Index of Contents* for the closing volume, and an ornamental *title page*, for binding.

With this number of the SCIENTIFIC AMERICAN nearly all of our annual subscriptions expire. It has been our rule for years to erase every name from our books as soon as the term paid for expires. Those who do not wish to have the paper discontinued, will, therefore, please remit *at once* for a new year.

We have now to present our customary parting salutation to readers and friends. We return our hearty acknowledgments for the kind favor with which our humble endeavors of the past year have been received by you. We wish you prosperity and happiness in all things. We invite you to close the finished volume, and help us to open and conduct the new one. We shall endeavor to show our appreciation of your past goodness by renewed exertions for your benefit during the future.

The Failure of the Atlantic Cable.

The great experiment has failed. The arrival of the *America* on the 24th brought a very brief despatch, announcing that the cable, after 343 miles had been paid out, parted, and they were obliged to abandon the enterprise for the present. One steamer returned, and Mr. Field hurried to London to confer with the directors, while the other steamers remained to try some experiments, the nature of which is not stated. The value of the stock in London, on the arrival of the vessel, sunk very low at first, but subsequently rose again to some extent before the sailing of the *America*.

Mr. Field telegraphed a report, setting forth that the last 100 miles were laid successfully in water over two miles deep; that at the time of the fracture, the brakes had just been applied with more force, and that the fracture occurred at a considerable distance from the vessel. We believe the last two points, but mistrust the literal accuracy of the first. The soundings taken by the *Aretic*, preliminary to the commencement of the enterprise, did not indicate a depth equal to two miles at any point so near the coast of Ireland as the fracture must have occurred, and we should only term a portion of the cable laid successfully which was laid nearly straight, or sufficiently so to enable the whole cable to be successful, if laid in the same manner. The proportion between the distance traveled and the quantity of cable laid will, we think, be ultimately shown to be too great, especially in the deep water, to be called a success.

There are great difficulties at the root of the matter. Laying a long cable at such immense depths may be accomplished by repeated trials, and so may navigating the air. The latter operation would require means not yet within the compass of engineering skill, and the same *may* be the case with the Atlantic telegraph. But the original plan for the grand telegraph was very promising. To start from the middle with a very liberal quantity of cable, and steam as rapidly as possible for the shore in each direction, paying out the thread nearly as fast as it wished to run, would seem a pretty certain method of getting the material down to the bottom in a continuous line, whether it would be of any service afterward or not.

There is a limit to the speed with which any object will sink through any dense fluid. A telegraph cable extended horizontally sinks with a certain determinate velocity; and the angle at which it stretches downward in the wake of the ship from which it is delivered, must depend mainly on the speed of the ship. To illustrate this, suppose a vessel could start from one shore, and move quick as thought to the opposite shore, it is evident that a cable paid out freely on its rapid flight would lay in a tolerably straight line on the surface, and would commence sinking uniformly at all points. Now if the vessel moves more moderately, the sinking cable will obviously trend downward from the stern, the few fathoms last paid out being just descending beneath the surface, that delivered one minute before being at the depth of 1,000 feet, that two minutes before being 2,000 feet, and so on, until it rests on the bottom. The angle, therefore, at which the cable lies as it sinks through the water, must depend on the speed of the ship, or on the length of the horizontal path described by the ship during each minute of time. It is vain to attempt to support it materially by any strain applied to it, like the cables of a suspension bridge, as the distance between the supports is, in this case, too great to make tension of any service in this respect. The cable will sink freely as rapidly as its gravity can induce it to overcome the resistance of the water.

When, in consequence of a low speed of the vessel, the sinking cable stands inclined to a very great degree, it tends to move backward from the ship, sliding downward on the inclined frame formed by the resistance of the water. In other words, the cable finds less resistance in sinking endwise than sidewise; and so soon as it becomes much inclined, it endeavors to run out lengthwise, like a sounding line. This motion of the cable backward, when once commenced, is difficult to check, as the mass in motion is great, and the momentum due to such motion assists the generating cause in straining the cable when the brakes are applied to retard its delivery.

The more rapidly a ship advances, the less serious is the inclination of the cable thus to slip backwards, and the less liability is there to deposit it in serpentine folds on the bottom. The method finally adopted by the conductors of this enterprise was evidently not the best, as the vessel moved only three or four miles per hour, and the disposition to slide backward had to be resisted by main force. The brakes were gradually applied with more force to effect this, and the cable parted. It broke at a distance from the vessel, because, although the strain was greatest at the point where it left the reel, the pressure of the water at a considerable depth had probably compressed the core, and allowed the wires to stand unsupported.

It is now late, and the stock of the cable (never too liberal) has been reduced by the loss. The experiment will not probably be repeated this season in any form.

Before our next we shall probably receive full reports on the subject. The experiment had proceeded far enough to be of great service. There are a score of important questions relative to the evenness of the strain on the cable, or the existence of pulsations or waves in it, the increase or diminution of the twist, etc., all of which the results of this effort will probably solve when fully known.

Secretary Thompson and the Patent Office.

We understand that the present Secretary of the Interior, Hon. Jacob Thompson, takes a deep interest in the success of the Patent Office. This is as it should be, and if it proves true from his official acts, he will enjoy a reputation on this point which we do not feel willing to ascribe to any of his predecessors.

In the selection of R. R. Rhodes, Esq., of Louisiana, as the successor of Dr. Breed, in the Chemical Department, it appears that his qualifications were vouched for to Judge Mason by the Secretary, and we are happy to learn that evidence of his fitness is already seen. As a general thing, the examining corps are able, faithful and capable, and we should be sorry to learn of removals on mere political grounds. The guillotine, however, could be usefully employed in two or three departments, and we shall be glad to see it put to work, as we doubt not it will be in due time. We presume, however, that no removals will be made until a new Commissioner is appointed.

Polytechnic College.

We call attention to the advertisement of the Polytechnic College of Philadelphia, which is inserted in another column. It is conducted somewhat on the plan of the industrial colleges of France and Prussia, and affords a thorough professional education in civil, mining and mechanical engineering, industrial, analytical and agricultural chemistry, metallurgy and architecture. Why shall we not sustain such institutions in our own country instead of sending our sons to Paris, Gottengin, or Berlin, where, as it too often the case, they make shipwreck of themselves amidst the loose and corrupting influences of European city life?

Fifteen Hundred Dollars in Prizes.

Don't stare, reader! we have not opened a lottery office, nor have we opened our columns to others who are engaged in that nefarious business; but we have a *scheme* to offer, laudable and worthy of consideration by any person who would like to receive a few dollars, or a few hundred dollars, as a New Year's present. The amount of $1500 will be paid to some persons on the 1st of January, 1858; and those who exert themselves the most, and obtain the largest lists of subscribers, will be the best rewarded. Annexed we give a list of the premiums which will be paid in cash to the successful competitors on or immediately after the 1st of January, 1858, which list we commend to the attention of all readers and friends of the SCIENTIFIC AMERICAN:—

For the largest List,	$300
For the 2nd largest List,	250
For the 3rd largest List,	200
For the 4th largest List,	150
For the 5th largest List,	100
For the 6th largest List,	90
For the 7th largest List,	80
For the 8th largest List,	70
For the 9th largest List,	60
For the 10th largest List,	50
For the 11th largest List,	40
For the 12th largest List,	35
For the 13th largest List,	30
For the 14th largest List,	25
For the 15th largest List,	
Total,	$1500.

Names of subscribers can be sent in at different times and from different Post Offices. For further information, see Prospectus on another page of this sheet.

Those who compete for the prizes will please to write the words, "Prize List," on *the left hand upper corner of the first page of every letter containing a list of subscribers;* as this will enable us to distinguish, at a glance, the letters of prize competitors from those of other correspondents, and will facilitate the crediting of names to the respective senders. Competitors will please bear this request in mind, especially when sending only a name or two at a time, as their claims will be likely to be overlooked by neglecting to do so.

Testimonial to Miss Maria Mitchell.

Preparations are making to procure a testimonial for Miss Maria Mitchell, of Nantucket, Mass., the celebrated female astronomer, who is now absent in Europe. It is thought that, if a sufficient sum is raised, the present to her will be the "Sharon Observatory," so called. Of the $3000 required for its purchase, more than one-third has been pledged by ladies in and near Philadelphia, to whom the Observatory is well known.

Gas Light on Steamers.

We see it stated that a firm in England has received instructions to fit the steamship *Great Eastern* with gas works and all necessary gas fittings, on a most elaborate scale. Some of the steamers on our rivers have been lighted with gas with tolerable success, and the effort will probably be highly conductive to economy, as well as safety and convenience, on so large a ship as the *Great Eastern*.

A Philadelphia dentist is stated, in an exchange, to have invented what he calls a galvanic forceps, which is intended as a relief to the pain of extracting teeth. It is a combination of the ordinary forceps, with a galvanic arrangement attached, whereby the nerve of the tooth may be so charged with the galvanic influence that its sensibility will be partially supended.

California has passed a law to make the scientific development of the human body the order of the school hours upon the Pacific. All her common schools are to have apparatus and teachers of gymnastics; and with her delicious climate and extraordinary civilization, she will keep the lead she has got of all the States.

The Portuguese Government has invited tenders for the construction of an artificial port at the island of St. Michael, in the Azores, individuals or companies, native or foreign may join in the competition.

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Sewing Machine Suit in Great Britain.

The case of Thomas *vs.* Reynolds, recently tried by the Court of Queen's Bench, London, before Lord Campbell and a special jury, is of more than ordinary interest on several accounts, one of which is the attempt to break the Howe patent on the ground of want of novelty. Until the introduction of Mr. Howe's invention, no practically useful sewing machine had been used in England. The plaintiff a stay manufacturer at Birmingham, invited the inventor to England, and engaged him to adapt his invention to the sewing of stays, which, at that time, were covered with ornamental stitching. This he effected by the use of a traversing frame which held the work distended, and passed it under the action of the sewing instruments. It appeared that machines, possessing some of the essential features of Thomas's machine, had been extensively manufactured in the United States, and imported into Great Britain by Messrs. Grover & Baker, of New York, who were licensees under Howe's American patent; and that, seeing others, the defendant had purchased such machines and employed them in his business.

For the defence, it was not attempted to deny the infringement, but the validity of the patent was questioned, on the ground of want of novelty, from the publication of material parts of the plaintiff's invention in the specifications of some eight patents of prior date to the plaintiff's. Of these, the defendant relied mainly on a patent granted to John Duncan, in the year 1804, for a new mode of tambouring or raising flowers, figures, or other ornamental devices upon muslins, &c.; and on another patent granted to Messrs. Fisher and Gibbons, in the year 1844, for improvements in the manufacture of figured or ornamented lace, or net, or other fabrics. In Duncan's specification a traversing frame was shown, for holding the cloth at tension, and presenting it to the action of a series of needles and hooks, which were thus enabled to form isolated patterns all over the fabric. This was proved by plaintiff's witnesses to be distinct from his frame, inasmuch as the traverse of Duncan's frame was necessarily limited, to suit the special work required; whereas the plaintiff's would traverse the fabric so as to form a row of stitches from selvage to selvage. And further, Duncan's frame required to be moved by hand after each stitch, while plaintiff's was self-acting, and dependent on the movement of the needle and shuttle, which formed the second claim under the plaintiff's patent. It was, however, shown by the plaintiff's witnesses, that there was a material difference between the two arrangements. The form of the stitch was the same in both arrangements, but the mode of producing it was very different. The evidence for the defence went to prove the similarity of Duncan's and the plaintiff's frame for holding and traversing the work; and the anticipation by Fisher and Gibbons of the plaintiff's claim for the needle and shuttle; their specification having contemplated, in express terms, the sewing of two fabrics together.

Lord Campbell, in summing up, said that notice had been served upon Mr. Baker that he would be sued, but he left the country; and "then the plaintiff reluctantly, but necessarily, brings an action against this stay-maker at Birmingham, who was using the machine. Duncan's machine could not properly be called a sewing machine; but that is a matter of fact for your consideration. The witnesses for the plaintiff have stated that it is essentially different from what is stated in plaintiff's claim, No. 3. The defendant's witnesses you have heard, and I must own I was a little surprised to hear that they considered that Duncan's was a sewing machine; but if it be a sewing machine, it is very wonderful that from the year 1804 to the year of grace, 1846, there was no practically useful sewing machine, either in England or America. But one of the witnesses said, that a workman reading Duncan's specification would at once find that it was a sewing machine. It is to be regretted that the world for forty years lost the advantage of such a happy invention. But, gentlemen, if you think it [claim No. 3 for the stretching frame] is substantially the same, although Mr. Howe did not copy it, or Mr. Thomas did not copy it, the law is, that being substantially the same, and being so disclosed by the specification of 1804, the patent would be invalid. But I cannot help owning that I was a little surprised to hear that they could be the same, if it was necessary in the one always to stop and re-adjust the machine for any change in the pattern; whereas the other could go on and change the fabric to be sewn exactly according to the will of the workman who was superintending the machine. That would have constituted, as one would think, a material difference between them; but one of the witnesses says that that might be done even in Duncan's; that Duncan's will work vertically, laterally, and horizontally. That is contrary to the evidence given on the part of the plaintiff; but you must form your own opinion. If you think that this really was substantially the same, though unknown to Howe, and although it slept for nearly half a century, if it be substantially the same as that which is described in the claim No. 3 of Howe's invention or Thomas's patent, then your verdict upon that will be for the defendant: but if you think there is no satisfactory evidence given to you to show that either claim No. 2 or No. 3 had been anticipated—that Fisher and Gibbon's patent and Duncan's are materially different from the description of the claim, either in No. 2 or in No. 3—then your verdict will be for the plaintiff."

The jury deliberated for a few minutes, and found a verdict for the plaintiff, with nominal damages, forty shillings.

This decision establishes the Howe patent in Great Britain.

CONDENSING LIQUIDS IN GAS PIPES.

Fig. 1

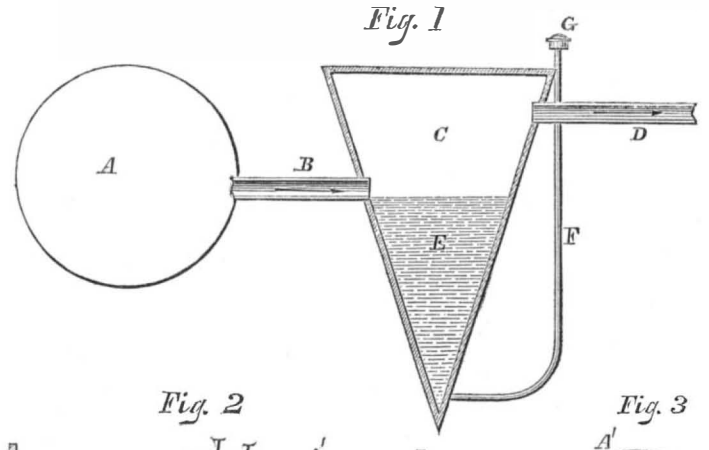


Fig. 2

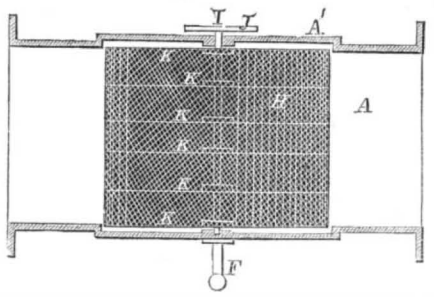
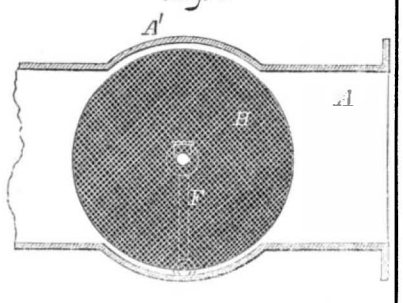


Fig. 3



Gas, when first distilled from coal, contains several ingredients of an objectionable character, one of which is sulphur. One of the important purifying processes consists in washing with water. But in this process two effects are produced. The water absorbs the impurities from the gas, but the gas also absorbs a quantity of water; in other words, the gas becomes saturated with water; and although this evil, by the processes adopted, is not as great as might be imagined, there is still a sensible quantity of liquid held in suspension in the gas, and when the pipes leading it to the burners are very cold, the liquid condenses and collects in depressions, causing much annoyance, and often serious damage.

The invention illustrated in the accompanying engravings abstracts the water by presenting to it a fluid for which it has great affinity, and extending the surface of contact, and so presenting it to the flow of the gas that every particle of water is absorbed. The fluid used is alcohol, and the method of presenting it consists in compelling the gas to pass through one or more strata of wires wet with the absorbent fluid.

Fig. 1 is a vertical section, Fig. 2 a horizontal section, and Fig. 3 a vertical section, at right angles to that in Fig. 1.

A represents the straight main, A' an enlargement thereof, and B a service pipe, which conveys the gas from the main to the burners. E is a conical reservoir, and D a continuation of the service pipe. E contains a pool of alcohol, and F is a feed pipe through which it is supplied. G is a stopper, by removing which the alcohol mingled with water may be withdrawn at any time, and preserved for re-distillation. H represents a wire gauze cylinder, which is rotated slowly by clockwork, and every portion of its periphery being, at one part of each revolution, below the surface of the alcohol, E, every portion of the cylinder is invariably wet, and ready to absorb the water from the gas passing through its interstices. A portion of the alcohol becomes vaporous, or dries up from the cylinder; but this vapor, unlike that of water, produces no material difficulty by subsequent condensation.

I represents the shaft on which the wire gauze wheel, H, is mounted. It fits tightly and easily in the side of the enlarged main or case, so that little or no gas escapes around it. J is a wheel, by which motion is communicated to I from suitable clock-work not represented. K K, etc., represent simply disks within the wheel, H, which increase the wetted surface presented without retarding the gas.

The inventor of this ingenious device is John Walton, of Louisville, Ky. It was secured by Letters Patent on the 30th of June last. Further information may be obtained by addressing him by mail.

Air Brake for Cars.

One of the latest English patents connected with railroad operations, involves the conveying of power, by allowing compressed air to travel through a tube to the point where the power is required. It consists in working the brakes of railroad cars by having as prime mover an air pump or pumps fixed to the frame-work of the carriage of the engine, tender, or other carriage, or to more than one carriage. Each air pump or prime mover is to be worked by a crank or eccentric, either direct from the ordinary axle or by a separate axle, with any of the well known appliances for instantaneously throwing the same in and out of gear, or the air pump may be worked by the guard or driver. The other parts consist of a cylinder, piston, and connections, attached direct, or by means of levers, as convenience or circumstances may require, to the brake or brakes in each carriage. The cylinders connected immediately with the brakes may be placed on the side, top, or beneath the seats of the carriages, and the apparatus is applicable to both old and new carriages. The patentee proposes to employ air, say at eighteen pounds to the inch, compressed to about half its bulk. The pipes through which the compressed air is transmitted from the prime mover to the cylinders connected with the brakes, may be carried either under the bottoms or along the roofs of the carriages. The fixed parts of the pipes may or may not run the length of each carriage, and are to be of metal, or otherwise, with unions at the ends, and self-acting air-tight valves opening inwards. The other parts of the pipes for making the connections are to be flexible, with metal ends forming parts of the unions, or other joints, and are so constructed as to open the valves in the ends of the metal pipes when being screwed up, or otherwise attached. It is a clumsy affair, possessing little novelty.

Coating Articles of Iron with Metallic Alloys

Among the recent patents secured through the Scientific American Agency, is one granted to Joseph Poleux, for the above purpose. This invention consists in preparing iron to receive the coating, by immersing it in concentrated mineral acids. As soon as the articles to be cleansed are immersed in the acid, one, two, or more small pieces of spelter are dropped among them, or the spelter is passed into the acid with the articles. The acid acts at once and rapidly on the spelter, holds in solution what it dissolves, and precipitates the film of it on the minutest portions of the iron surfaces the instant the acid has cleansed them, and this film protects such portions from any further action of the acid while remaining in it. Without the spelter, undiluted acid could not be used without great waste and injury to small or thin articles placed in it. The articles are next taken out, and without being washed, dried, or undergoing any other treatment whatever, are passed immediately, though slowly, into the bath of melted alloy that forms the coating. Mr. Poleux employs muriatic, nitric, or sulphuric acid, of the ordinary degrees of concentration in commerce, (viz., muriatic, of 18° Beaume; nitric, 38° Beaume; and sulphuric, 66° Beaume, or there abouts,) without dilution.

Great Cotton Factories.

The foundation of the largest cotton factory in the world has just been laid in Russia, on the island of Cronholm, in the river Narova, between its two cataracts. It is in the form of a grand square, and will possess 1,672 windows, 20,000 gas burners, and will employ 3,000 hands.—*Exchange.*

[We regret that we cannot learn the dimensions of this mill from the above. The Saltaire Mill, of England, only 500 feet long 50 wide, and five stories high, has been claimed in English journals to be the largest in the world, but it does not equal several in this country. The Pacific Mills, at Lawrence, Mass., will be, when completed, 800 feet long, 75 wide, and practically seven stories high, with print works attached, 1,500 feet long. The Lord Mill, now being erected near Norwich, Conn., is 950 feet long, and 75 feet wide, but we have not learned its hight; and there is reputed to be a mill now in operation in Portsmouth, N. H., which is a trifle larger than that. No one should proclaim anything "the largest in the world" without giving data from which others may judge the correctness of the statement.

Salt and its Properties.

The August number of *De Bow's Review* contains an able article on the subject of salt, its manufacture, properties, uses and varieties, from the pen of William C. Dennis, of Florida. The principal object proposed by Mr. D. is to show the cause of the failure of the salt frequently used in preserving meats to perform that office, and to point out the method of remedying the evil. No one who has the slightest acquaintance with the immense loss occasioned every year in this country by the spoiling of butter, fish and *cured* meat, particularly bacon, will be disposed to undervalue any effort to analyze the reason of the fact, and designate the method of prevention. The cause of the evil Mr. Dennis finds in the imperfect crystalization of all salt made by boiling, in which is included the Liverpool salt—the variety most used in this country. The substitution of salt produced by evaporation—a process, the slowness of which insures the perfection of that chemical process whose final result is complete crystalization—is the proposed remedy.

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W. H. S., of R. I.—It is too bad that the Patent Office should get so far behind in its examination; but we have a number of cases in the agricultural department, to which yours belongs, which have been waiting for examination nearly six months. As soon as your case is heard from, we will advise you by mail.

J. E. Jr., of Iowa.—No progress can be made in securing you a patent until the Patent fees are paid. "Uncle Sam" does not do business on a credit system, neither do we ourselves. We would not advise you to sell your home to procure money to take out your patents. They might not be profitable to you after they were obtained, and water wheels at the present day are a difficult subject to obtain patents upon. Your mode of communicating power is not new.

H. A. R., of N C.—The Coining press to which you refer was much improved by Franklin Peale more than twenty years since, and has been used in the principal Mints of the United States. The main features in it were the peculiar adaptation of the toggle joint, by means of which the pressure acts with increasing force, and should there be no "form" between the dies at the time the blow is given, no injury is sustained. Coining presses of a similar character had long been in use in the French and German Mints.

W. H Auld, of Brighton, Iowa, wishes to procure a machine for making Venetian blinds.

C. A. C., of Mass.—You have "Colburn on the Locomotive" and "Bourne's Catechism of the Steam Engine," and ask what you shall get next? You should have stated your business. "Bartlett's Mechanics" (price $2) will teach you a great deal that many excellent mechanics do not know; but if your profession is steam engineering, procure "Wiessenborn's American Engineering," now being issued in numbers. There are five numbers out, at one dollar each.

C. S. W., of Iowa—Your method of stamping the post mark upon the letter seems good, but we do not regard it as patentable.

W. G. B., of Mass.—A lamp lowered in your well is immediately extinguished. What can you do? Adopt any method of stirring up the air. Draw up water and pour it down again half a dozen times, then try your lamp. If you still find the evil not remedied, take some quick lime mixed with water in a suitable vessel and lower it down to the water's edge—this, by its affinity for the carbonic acid gas will absorb it.

S. A., of Ill.—The article used for polishing is common emery put upon the belt by glue or any other similar adhesive mixture.

W. W. B., of N. Y.—Your application on the lubricating compound has not been acted upon at the Patent Office.

R. S. B., of La.—You state that you are a subscriber to the Scientific American, that you appreciate our intelligent judgment, etc. We thank you for your compliment, but must say you have not been a very careful reader of the paper, or you would have discovered before this that the idea of propelling vessels by receiving the water at the bow and forcing it through tubes at the stern is a very old invention. We have occasion to answer the same inquiry through our correspondence column almost every month.

J. W. S., of Ill.—We have examined the specimens of pearls sent to us, and we do not consider them of any value whatever.

H. M J., of N. Y.—A simple method of preparing gun cotton, according to the English patent of Taylor, 1846, is to mix in any convenient glass vessel an ounce and a half, by measure, of nitric acid (sp. gr. 1·45 to 1·50) with an equal quantity of sulphuric acid, (sp. gr. 1·80.) When the mixture has cooled, place 100 grains of fine cotton wool in a wedgewood mortar, pour the acid over it, and with a glass rod imbrue the cotton as quickly as possible with the acid. When the cotton is completely saturated, pour off the acid, and squeeze it out as much as possible; then wash the cotton in water until it is completely divested of its acid taste. Finally, squeeze it in a linen cloth, and dry it in a room heated by steam or hot water from 150 to 170 degrees.

E. H., of Ohio.—There is nothing to be gained by your proposed plan of locomotive for steam plowing, besides it is very old. We have had many models in our office which have had carriages of this kind

A. J. R., of N. Y.—In the treatment of silk during the process of its manufacture into fabrics, the thread is divested of about 25 per cent of glutinous matter. Therefore, to render the fiber capable of being re-used, you would need to restore this gummy substance to it. You can now see why your machine for picking and separating refuse pieces of silk will be of no practical value. We remember of securing a patent, some years ago, for an improvement in music boxes; and the patentee was in high spirits when he got his parchment with the broad seal of the Patent Office thereon. His feelings, however, subsided when he found that there were no such instruments made in this country, and therefore his invention could not be made available for any practical purpose.

A. M. S., of Mass.—There are several cements on sale at the stores, for mending porcelain articles. Any of them would, perhaps, answer, though it would be better to purchase a new artificial eye than to attempt to mend a broken one. A little heat would have no effect. A cement known as the Diamond Cement is as good as any known to us.

H. M. S., of N. Y.—The "Gazetteer" to which you referred to find what county the town of Clinton, Ohio, was in, must have been a pretty old edition, to contain eight different places by that name in one State. Our Post Office Guide contains only one place by that name in Ohio, which is situated in Summit county. There are twenty-five towns by that name in this country, but they are located in different States.

Money received at the Scientific American Office on account of Patent Office business for the week ending Saturday, Aug. 29, 1857:—

J. G., of N. H., $25; C. A. H., of Mich., $25; A. L., of N. C., $55; C C. T., of Wis., $60; J. L. A., of N. Y., $35; D. C. J., of Ala., $29; D. H., of Ky., $55; N. E. B., of Mass., $30; A. C. A, of Conn, $30; A. O B., of Ky., $25; H. A. C., of N. J., $25; J. A. W., of Iowa, $30; L. & B., of Mass., $10; H. T. G., of Mass., $30; R. S. R., of Mass., $30; S. R. H., of N. Y., $250; S. P. C., of N. Y., $30; A. G., of Mass., $30; W. H., of N. Y., $100; D. F. L., of N. Y., $250; M. J. W. of N. Y., $12, E. M. & J. E. M., of N. Y., $25; O. N., of Pa., $10; E. H. B., of Mass., $25; J. P., of Wis, $20; G. T. J., of Ga., $25; J. N. J., of Mass., $130; C. S. S., of L. I., $27; S. B. D., of N. Y., $60.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Aug. 29, 1857:—

D. C. Jr., of Ala.; C. A. H., of Mich.; J. G., of N. H.; C, S. S., of L. I.; J. L. A., of N. Y.; F. K., of France; E. M. & J. E. M., of N. Y.; M. J. W., of N. Y.; P. F. C., of Ohio; H. A. C., of N. J.; A. O. B, of Ky.; O. N., of Pa.; N. & C., of Pa.; H. B., of N. Y., (2 cases); E. H. B, of Mass.; S. B. D., of N. Y.; C. C. J., of Ohio.

Special Notices—Important to Everybody.

The annexed list of notices is intended to answer inquiries made by some of our correspondents every day, and we hope they will be attentively read:—

Infallible Rule—It is an established rule of this office to stop sending the paper when the time for which is was prepaid has expired, and the publishers will not deviate from that standing rule in any instance.

Give Intelligible Directions—We often receive letters with money enclosed, requesting the paper sent for the amount of the enclosure but no name of State given, and often with the name of the post office also omitted. Persons should be careful to write their names plainly when they address publishers, and to name the post office at which they wish to receive their paper, and the State in which the post office is located.

Binding—We would suggest to those who desire to have their volumes bound, that they had better send their numbers to this office, and have them executed in a uniform style with their previous volumes. Price of binding, 75 cents.

Foreign Subscribers—Our Canada and Nova Scotia patrons are solicited to compete with our citizens for the valuable prizes offered on the next volume. It is important that all who reside out of the States should remember to send 25 cents additional to the published rates for each yearly subscriber—that amount we are obliged to prepay on postage.

Receipts—When money is paid at the office for subscription, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a bona fide acknowledgment of the receipt of their funds. The Post Office law does not allow publishers to enclose receipts in the paper.

Subscribers to the Scientific American who fail to get their papers regularly will oblige the publishers by stating their complaints in writing. Those who may have missed certain numbers can usually have them supplied by addressing a note to the office of publication. See list of numbers which are out of print in the next paragraph.

Back Volumes and Numbers—All the back volumes of the Scientific American are out of print, and cannot be had; except Vols. 6, 7, 11 and 12. Copies of volume 12 will not be bound and ready for delivery until about the 12th of September. The other volumes can now be had on application. Price, bound, $2 75 each; in sheets for mailing, $2. We have about seventy numbers of volumes 8, 9 and 10, which we will mail to any person desiring them on receipt of one dollar. To save subscribers the trouble of writing for such numbers as we have not got of the volume just closing, we append a list of the numbers which are entirely exhausted:—1, 2, 3, 4, 6, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 21, 22, 23, 24, 27, 30, 31, 35, 36, 38, 39 and 43 Those numbers that are not specified above we can supply, and shall be happy to do so to those who have missed them.

Every Subscriber would do well to try and get one or more of his neighbors to send their names with his own, even if he has no wish to avail himself of our club rates. The larger the package of papers sent to one address or the same post office, the greater is the certainty of getting the paper regularly. A single paper is sometimes mislaid or overlooked in sorting the mails at some one of the intermediate post offices through which it has to pass, while on the contrary, we have noticed that a large package seldom fails to reach its proper destination.

AMERICAN AND FOREIGN PATENT SOLICITORS.—Messrs. MUNN & CO., Proprietors of the Scientific American, continue to procure patents for inventors in the United States and all foreign countries on the most liberal terms. Their experience is of twelve years' standing, and their facilities are unequalled by any other agency in the world. Consultation may be had with the firm between nine and four o'clock daily, at their principal office, 128 Fulton st., New York. Our branch offices are corner of F and Seventh sts., Washington, D. C., Nos. 66 Chancery Lane, London, 29 Boulevard Saint Martin, Paris, and 3 Rue Therrsienne, Brussels. Circulars of information concerning the proper course to be pursued in obtaining patents through our Agency, the requirements of the Patent Office, etc., may be had gratis upon application to the principal or either of the branch offices. Communications and remittances should be addressed to MUNN & CO., No. 128 Fulton st., New York.

MECHANICS' CHART contains Tables indispensable to all mechanics and business men. Mailed for two letter stamps. JOHN PHIN, Rochestor, N. Y. 1*

WANTED—A second-hand Screw-Cutting Lathe, 5 to 6 feet between centers, not less than 18 inch swing. Must be complete, and in perfect running order. Address, stating price and dimensions, ALFRED KAPP, care of Box 3750, Post Office, this city. 1*

MACHINERY—Steam Engines, Engine Lathes, Iron Planers, Woodworth Planers, Saw Mills, and a variety of other machinery, for sale very low for cash, to close consignments, by A. L. ACKERMAN, 52 10 163 Greenwich st., New York.

THE WORKSHOP COMPANION contains Useful Tables, Rules, Data, Recipes, &c. Mailed for four letter stamps. JOHN PHIN, Rochester, N. Y. 1*

J. A. FAY & CO., Worcester, Mass., build the best improved Woodworth Planers and Matchers. Patented Aug. 11, 1857. Wrought iron cutter head and flexible mouth piece will plane from 1-8 to 4 inches thick. 52 5*

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TO INVENTORS—A gentleman who has had considerable experience and success in the management and sale of patent rights, offers his services to inventors on equitable terms, or he will buy a good patent, or an interest in one. References exchanged. Those of the advertiser are of the highest standing in commercial and scientific circles. Address L M. W., Box 170, Tribune office, New York. 1*

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FOR SALE—The entire machinery and real estate of the Diamond Mills Manufacturing Co., will be sold at public auction of the 20th of October next, commencing at 10 o'clock, A. M., upon the premises, Lansingburgh, Rensselaer co., N. Y., unless previously sold. For particulars address A. E. POWERS, President, 52 3*eow Lansingburgh, N. Y.

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DR. D. BREED, late Assistant and acting Chief Examiner in the U. S. Patent Office, has established at Washington, D. C., a chemical laboratory for experiment and analysis, in order to test and improve processes of manufacture, and mechanical devices employed in the chemical arts, and to procure and defend patent rights. After many years devoted to chemistry (having studied in the German laboratories) Dr. Breed feels confident in offering his services as a practical chemist to inventors and others interested in the chemical arts and manufactures. 50 4*

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THE TENTH ANNUAL EXHIBITION of the Maryland Institute, Baltimore, will be opened on the 29th of September, and continue to the 27th of October, 1857. Goods for competition and premiums will be received from 22nd to 24th of Sept. inclusive, afterwards for exhibition only. Mechanics, manufacturers, inventors, artists and others, of the entire country, are respectfully solicited to contribute to the same, and assured that every effort will be made to display their works to the best advantage. Circulars containing rules, regulations, &c., will be promptly furnished by application to JOHN S. SELBY, Actuary. 49 5* JOSHUA VANSANT, Chairman.

FOR SALE AT FLUSHING, Long Island, N. Y.—The business and machinery of John C. Quarterman's estate, consisting of a six-horse power steam engine, a ten-horse power boiler, lathes, saws, boring and drilling machines, rounding machines, saws for scroll work, and a machine for making shovel, coal hod and pail handles, together with all the tools and fixtures. The business has been established from the year 1851, and to an ingenious mechanic opens a good prospect. For particulars apply to JAMES QUARTERMAN, 114 John st, New York, or to SARAH ANN QUARTERMAN, Flushing, L. I., who resides on the place. 49 6

TO HOUSEKEEPERS—I own the copyright of the celebrated 100 Metropolitan Hotel recipes for Cooking, Baking, making Creams, Pastry, Preserves, &c., &c, and will send them by return mail (free of postage) on receipt of four letter stamps. J. R. STAFFORD, 16 State st, New York. 49 4

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WOODWORTH'S PATENT PLANING MAchines of every kind and all prices. A large assortment on hand; and I am prepared to construct any machine to order from ten days to two weeks, and guarantee each machine to be perfect in its construction, and give purchasers entire satisfaction. The patent has expired, and will not be renewed. I make this business exclusive, manufacturing nothing but the Woodworth Machines, and for that reason can make a better article for less money; and with my fifteen years' experience I fully guarantee each machine to come up to what I am willing to recommend, that is, that each machine shall be more than equal to any other manufactured for the same price. JOHN H. LESTER, 57 Pearl st., Brooklyn, N. Y., three blocks above Fulton Ferry. 35 tf

PEARSON CROSBY'S PATENT RE-SAWING Machines.—The Crosby patent for re-sawing lumber, having been re-issued April 28, 1857, and having purchased the right to the same for the State of New York and Northern Pennsylvania, the subscriber is prepared to sell rights to use the machines in the greater portion of the above named territory, and also to furnish the public with these machines. Having re-built my machine manufactory—which was destroyed by fire on the 9th of Feb. last—I continue to manufacture and have on hand for sale, Woodworth's Patent Planing Machines, from $150 to $1,500, and of a quality unequalled by any other manufacturer. Also the separate parts of the machine, namely, planing knives, side tools, side cutter heads, cylinders, &c., as well as the above named Crosby Re-sawing Machines. JOHN GIBSON, 48 13* Planing Mills, Albany, N. Y.

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L. D. GOODWIN'S celebrated Patent Central Vent Water Wheel For wheels or the right of territory address J. W. DWIGHT, Dryden, N. Y., or E. C. BRAMHALL, 190 Fulton, N. Y. 44 10*

LAP-WELDED IRON BOILER TUBES.—Prosser's Patent.—Every article necessary to drill the tube-plates, and set the tubes in the best manner. 44 26 THOS. PROSSER & SON, 28 Platt st., N. Y

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THE BEST PLANING MACHINE IN THE World—Patented Nov. 21, 1854 and Nov. 13, 1855. These patents were obtained for improvements upon the celebrated Woodworth Planing Machine. They received a Gold Medal at the last exhibition of the Massachusetts Charitable Mechanics' Association. Machines of all kinds and sizes constantly on hand, which are warranted to give entire satisfaction, and to be superior to any now in use. For further information address the patentee, JAMES A. WOODBURY, No. 1 Scollay's Building, Court st, Boston, Mass 42 13*

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NEW HAVEN MFG. CO.—Machinists' Tools, Iron Planers, Engine and Hand Lathes, Drills, Bolt Cutters, Gear Cutters Chucks &c., on hand and finishing. These Tools are of superior quality, and are for sale low for cash or approved paper. For cuts giving full description and prices, address, "New Haven Manufacturing Co., New Haven, Conn. 40 tf

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Science and Art.

The Woodworth Planing Machine.

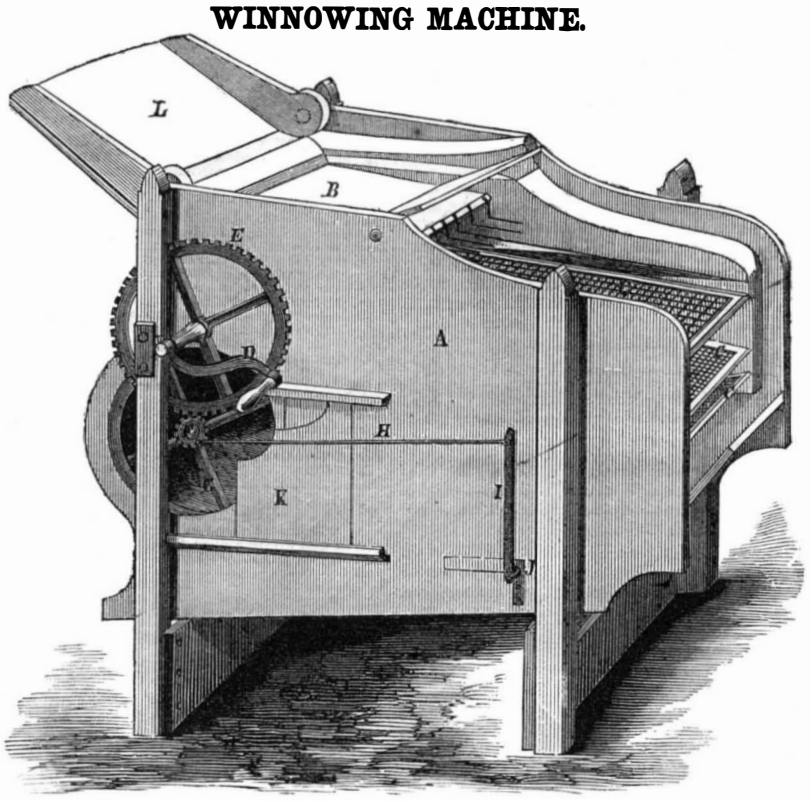
We are in pursuit of information concerning a new game, which, we learn, is attempting to be practiced by some of the Woodworth assignees. If the rumor is substantiated by evidence, we shall have another chapter to write, in a week or two, on the planing machine monopoly.

Sheple's Winnowing Machine.

The ancient process of pouring out grain under the influence of wind to separate the heavy grain from the chaff has long been abandoned for a simple machine which allows the grain to fall more evenly and slowly, and subjects it to a more powerful blast artificially generated by a fan. The improvements in the machine are necessarily confined to modifications of the detail so as to ensure greater simplicity and durability, and more rapid or more easy action.

The engraving here presented is a perspective view of a machine on which an application has been made for a patent. A is the frame, B the hopper platform, and C C the seives. D is the crank by which the machine is operated. E is a large gear wheel on the crank shaft. F is the quick shaft, on which the fan G is mounted. The seives, C, are connected to a light rock-shaft, J, on which is fixed the shaking lever, I, outside the frame. H is a rod connecting I with a crank on the fan shaft, as represented. K is a door which may be opened and closed to any desired extent to regulate the supply of air to the fan, and consequently to increase or diminish the blast through between the seives. L is a hinged feed apron, a very convenient attachment which may be extended when required for use, and folded up when the machine is to be stowed away or transported.

WINNOWING MACHINE.



For further information, address the inventor, C. C. Sheple, Waterbury, Vt., who has applied for Letters Patent.

Sugar Maples.

The New York *Tribune* has published several articles setting forth the importance of the soft maple as an ornamental and valuable tree in other respects, and also as a sugar-producing tree. In a late issue it presents the following, from an experienced sugar maker in Vermont:—

"The flow of sap from this variety of the maple is considerably larger than the variety known as sugar or rock maple—probably double in quantity. But it does not contain more than half the saccharine quantity *per gallon* contained by the sap of the other variety. Sugar can be made from the soft maple sap, and also from the sap of the yellow birch (which flows in still more plentiful amount); but the difficulty is that so much more fuel is required to reduce the sap to sugar than is required with that syrup derived from the sugar maple, that it will not pay the cost."

In addition to this difficulty, it is understood that soft maple and birch sap will not granulate into sugar, but will, like the juice of the *Sorgho Sucre*, remain a simple cheap syrup or molasses.

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